



Bristol-Myers Squibb Manufacturing Company

***RCRA Corrective Action Program
Quarterly Progress Report No. 62
1st Quarter 2016***

***Bristol-Myers Squibb Manufacturing Company
Humacao, Puerto Rico***

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- B. 4th Quarter 2015 Groundwater Sampling Analytical Results
- C. Vapor Intrusion Sample Analytical Results (on CD)
- D. 4th Quarter 2015 Groundwater Laboratory Analytical Reports, Vapor Intrusion Laboratory Analytical Reports, Groundwater Field Data Sheets, Data Validation Reports (on CD)

1.0 Introduction

Bristol-Myers Squibb Manufacturing Company (BMSMC) is currently implementing a RCRA Corrective Action Program at its pharmaceutical manufacturing facility located in Humacao, Puerto Rico. The program is being conducted in accordance with the provisions of Module III of BMSMC's Final RCRA Hazardous Waste Treatment and Storage Permit No. PRD090021056.

This quarterly progress report has been prepared in accordance with the provisions of Module III, Condition B.8 (a) of the Permit. The report covers the period October 1, 2015 through December 31, 2015. All available information required by Condition B.8 (a)(i) through (viii) is provided below.

*The United States Environmental Protection Agency (EPA) and the Puerto Rico Environmental Quality Board (PREQB) provided comments on RCRA Corrective Action Program Quarterly Progress Report No. 62 1st Quarter 2016 (April 2016) on October 27, 2016. BMSMC submitted a Response to Comments on December 16, 2016. EPA approved Quarterly Progress Report No. 62 on March 8, 2016 and requested that a new **Attachment A** be added to the Quarterly Progress Report No. 62 to include copies of the December 16, 2016 Response to Comments and the March 8, 2017 EPA approval letter. The revised report is included herein.*

The RCRA Corrective Action Program addresses three solid waste management units (SWMUs) at which impacts to soil and/or groundwater have been detected. The status of the corrective action program at each SWMU is briefly described below.

- Former Underground Tank Farm (SWMU #3) - This SWMU consisted of 26 underground storage tanks for the storage of raw materials, kerosene and spent solvents for reclamation. BMSMC submitted a CMS Report to USEPA in June 2007 that documented the improving groundwater quality and provided recommendations for the Final Corrective Measure. An updated CMS report was submitted to the USEPA in July 2011.

BMSMC conducted quarterly groundwater sampling at seven wells at this SWMU from March 2000 to December 2010 as part of the site-wide monitoring program. On March 12, 2010 BMSMC submitted a request for a permit modification to reduce the groundwater monitoring program. Based on USEPA comments, BMSMC submitted a revised request for a permit modification to the USEPA on July 20, 2010. BMSMC received approval for the permit modification from the USEPA on December 29, 2010. The reduction in groundwater monitoring as detailed in the permit modification was

initiated during the March 2011 groundwater sampling event. As per the permit modification, monitoring wells at SWMU #3 are sampled semiannually. Semiannual sampling started with the March 2011 sampling event.

Monitoring wells MW-17 and MW-18, installed during the 2011 Supplemental Field Investigation, were sampled on a voluntary basis from June 2011 to June 2012. A request to include monitoring wells MW-17 and MW-18 into the SWMU #3 groundwater monitoring network was included in the Class 2 Permit Modification Request filed with the USEPA on May 16, 2012. On August 14, 2012, BSMSC received approval for the Class 2 Permit Modification incorporating monitoring wells MW-17 and MW-18 into the groundwater monitoring network. Monitoring wells MW-17 and MW-18 were incorporated into the groundwater monitoring network beginning with the September 2012 groundwater sampling event.

- Former Brule Incinerator (SWMU #9) - This SWMU is the site of a former hazardous waste incinerator. The interim corrective measure (ICM) consisted of excavation of petroleum impacted soil. The *Interim Corrective Measure Implementation Report* was submitted to USEPA in February 2002. This report was approved by USEPA in a letter dated March 28, 2002.
- Building 5 Area (SWMU #20) - This SWMU encompasses an area adjacent to and east of Building 5. BSMSC submitted a revised CMS Report to USEPA in June 2007 that provided recommendations for the Final Corrective Measure. The recommended corrective measure included a combination of source area excavation and MNA. An updated CMS report was submitted to the USEPA in July 2011.

BSMSC implemented an Interim Corrective Measure (ICM) to address source area soils in the Building 5 Area. The ICM Work Plan, which included four phases of excavation, treatment, and reuse or offsite disposal of impacted soil, was submitted to USEPA in September 2003 and approved by USEPA in December 2004. Four phases of soil excavation and treatment were conducted between 2006 and 2011 during which approximately 7,400 cubic yards of soil was excavated and treated. Each of the excavation areas (Phase 1 through Phase 4; designated as Areas A through D) are shown on **Figure 1**.

On August 14, 2012, BSMSC received approval for a Class 2 Permit Modification for Temporary Authorization to operate a temporary unit (TU) for the ex-situ treatment of contaminated soil excavated from Area E and the remaining unexcavated soil from Area

D that was left in place during the ICM. In addition, the USEPA approved the May 2012 *Temporary Unit Operations and Maintenance Plan* (O&M Plan) and the May 2012 *Building 5 Area Interim Corrective Measure Work Plan Area E*. Area E ICM soil removal activities were conducted from February 6, 2013 through March 2, 2013. Approximately 1,728 cubic yards of impacted soil were removed and placed into the Biopile for treatment. The Area E excavation area is shown on **Figure 1**.

BMSMC conducted quarterly groundwater sampling at the SWMU #20 from March 2000 to December 2010 as part of the site-wide monitoring program. As per the December 2010 approved permit modification, BMSMC initiated a reduced groundwater monitoring program in March 2011. The reduced groundwater monitoring program includes quarterly sampling at seven wells and semiannual sampling at 13 wells. Semiannual sampling was initiated in March 2011. Semiannual samples are collected in March and September.

On August 14, 2012, BMSMC received approval for the Class 2 Permit Modification to reactivate monitoring well D-1. Semiannual sampling of monitoring well D-1 was initiated in September 2012.

On March 13, 2013, BMSMC received conditional approval of the Class 2 Permit Modification Request for the closure of three existing monitoring wells (G-1R2, D-1, and E-1) and the installation of three replacement monitoring wells (G-1R3, D-1R, and E-1R). Conditional approval of the Class 2 Modification Request was granted pending a determination that replacement well G-1R3 complies with the objectives of the groundwater monitoring program and effectively captures the Building 5 COCs.

On September 18, 2013, BMSMC, in response to the conditional approval of the March 13, 2013 Class 2 Permit Modification Request, submitted a technical memorandum to the USEPA demonstrating the effectiveness and adequacy of the replacement monitoring wells D-1R, E-1R, and G-1R3 to capture the Building 5 COCs.

On May 5, 2014, BMSMC submitted a Class 1 Permit Modification requesting an extension of 45 days to remove hazardous soil, and the remaining non-hazardous soil that met the cleanup criteria as provided in BMSMC Permit Temporary Unit Operations and Maintenance Plan, beyond the previously permitted 90 day removal period.

On June 19, 2014, BMSMC received final approval of the Class 2 Permit Modification Request for the closure of three existing monitoring wells (G-1R2, D-1, and E-1) and the installation of three replacement monitoring wells (G-1R3, D-1R, and E-1R).

On November 14, 2014, BMSMC received conditional approval of the *Building 5 Soil Vapor Investigation Work Plan*. The Work Plan was conditionally approved by the USEPA pending the receipt of a revised work plan that addressed minor comments within 45 days of the approval letter. The revised Work Plan was submitted to the USEPA on December 4, 2014.

On February 23, 2015, BMSMC received Comments on the Building 5 Area Source Removal Phase 5 Implementation Report from the USEPA. The comment letter stated that BMSMC must submit a revised *Building 5 Area Source Removal Phase 5 Implementation Report* within 45 days of February 23, 2015. The revised *Building 5 Area Source Removal Phase 5 Implementation Report* was submitted to the USEPA on April 8, 2015.

- Site-Wide

On March 14, 2013, BMSMC received the approved USEPA RCRA Permit Application Technical and Administrative Completeness Determination Letter for the May 2010 RCRA Part B Permit Application.

On February 26, 2015, BMSMC received Comments on the Corrective Measures Study Report (July 2011) from the USEPA. In the comment letter, the USEPA stated that BMSMC must submit a revised *Corrective Measures Study Report* within 60 days of February 26, 2015.

On June 3, 2015, BMSMC received a letter from the USEPA that granted a time extension to respond to the Comments on the Corrective Measures Study. In the time extension letter, the USEPA granted a time extension until July 24, 2015 for the submittal of a revised *Corrective Measures Study Report*.

On July 22, 2015, BMSMC submitted the *Response to USEPA Comments on July 2011 CMS Report* to the USEPA. The Response to USEPA Comments proposed additional work in each of the three SWMUs (FTF, Brule, and Building 5 Areas) to address USEPA comments on the July 2011 CMS.

On January 27, 2016, BMSMC submitted a Release Notification Letter to the USEPA that identified certain constituents present in groundwater that are currently not being addressed under the Corrective Action Program.

On February 26, 2016, BMSMC submitted a *Release Assessment Report* to the USEPA that identified specific constituents as new compounds of potential concern (COPCs) in the site's SWMUs.

On March 25, 2016, BMSMC submitted a *Release Assessment Sampling and Analysis Plan*, including an updated *Quality Assurance Project Plan* (QAPP), to complete a groundwater and soil investigation to evaluate potential release(s) of COPCs.

2.0 Description of Work Completed

A description of corrective action activities completed between January 1, 2016 and March 31, 2016 is presented in this section.

2.1 Former Tank Farm Area

- Upgradient monitoring well MW-9 was re-developed prior to the March 2016 groundwater sampling. Monitoring well MW-9 was last sampled in 1993.
- The 1st Q 2016 groundwater sampling was conducted in March 2016. This was a semiannual sampling event and included the collection of groundwater samples at ten monitoring wells (MW-3, MW-5, MW-7, MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, and upgradient well MW-9). Groundwater samples were analyzed for the following parameters:
 - Full target compound list (TCL) volatile organic compounds (VOCs), including tetrahydrofuran, p-isopropyl toluene, 1,2,4-trimethylbenzene, and benzyl chloride according to SW-846 Method 8260C;
 - Full TCL semivolatile organic compounds (SVOCs), including 1-methylnaphthalene, according to SW-846 Method 8270D;
 - Naphthalene and 1,4-Dioxane according to SW-846 8270D using Selective Ion Monitoring (SIM); and
 - Low molecular alcohols (LMAs) according to SW-846 method 8015C by direct aqueous injection (DAI).

- Locations of the groundwater monitoring wells are presented on **Figure 2**. Results from this sampling event will be included in the 2nd Q 2016 Progress Report.

2.2 Brule Area

- Monitoring wells BR-1, BR-2, and BR-3 were re-developed prior to the March 2016 groundwater sampling. Monitoring wells BR-1, BR-2, and BR-3 were last sampled in June 2001.
- The 1st Q 2016 groundwater sampling was conducted in March 2016. This sampling event included the collection of groundwater samples at three monitoring wells (BR-1, BR-2, and BR-3). Groundwater samples were analyzed for the following parameters:
 - Full TCL VOCs, including tetrahydrofuran, p-isopropyl toluene, 1,2,4-trimethylbenzene, and benzyl chloride according to SW-846 Method 8260C;
 - Full TCL SVOCs, including 1-methylnaphthalene, according to SW-846 Method 8270D;
 - Naphthalene and 1,4-Dioxane according to SW-846 8270D -SIM;
 - LMAs according to SW-846 method 8015C (DAI); and
 - Extractable Petroleum Hydrocarbons (EPH) using method Massachusetts Department of Environmental Protection (MADEP) EPH Rev 1.1
- Locations of the groundwater monitoring wells are presented on **Figure 3**. Results from this sampling event will be included in the 2nd Q 2016 Progress Report.

2.3 Building 5 Area

- Monitoring wells S-28, S-30, S-37, S-38, and MW-11 were re-developed prior to the March 2016 groundwater sampling. Monitoring well MW-11 was last sampled in 2000. Monitoring wells S-28, S-30, S-37, and S-38 were removed from the Building 5 Area groundwater sampling program in March 2011.
- Results of the 4th Q 2015 semiannual groundwater sampling event were validated in accordance with USEPA Region 2 guidelines. Locations of the groundwater monitoring wells are presented on **Figure 4**. The laboratory analytical results are provided in **Attachment B**.

- The second round of vapor intrusion sampling in Building 30 and Building 42 was conducted in January 2016. Six indoor air samples including one duplicate sample and six co-located sub-slab soil gas samples, including one duplicate sample, were collected in Building 30 and three co-located sub-slab soil gas and indoor air samples were also collected in Building 42. In addition, an upwind ambient air sample was also collected. Samples were collected in accordance with the approved 2012 *Building 5 Soil Vapor Investigation Work Plan* and analyzed for the complete USEPA Compendium Method TO-15 target compound list plus methane. The naphthalene concentration in indoor air and sub-slab soil gas was determined according to USEPA Method TO-17. Analytical results were validated in accordance with USEPA Region 2 guidelines. Sample analytical results are provided on CD in **Attachment C**.
- Electronic files including full laboratory analytical reports of the groundwater and vapor intrusion samples, data validation reports, and field data sheets are included on CD in **Attachment D**.
- The 1st Q 2016 groundwater sampling event was conducted in March 2016. This was an expanded groundwater sampling event and in addition to the 14 monitoring wells included in the current groundwater monitoring program [UP-1, UP-2, A-1R(4), A-2R(2), D-1R, E-1R, G-1R(3), S-29R, S-31R(2), S-32, S-33, S-34, S-35, and S-36], groundwater samples were collected at five additional monitoring wells (S-28, S-30, S-37, S-38, and MW-11) that are not currently in the Building 5 Area groundwater monitoring program. Groundwater samples were analyzed for the following parameters:
 - Full TCL VOCs, including tetrahydrofuran, p-isopropyl toluene, 1,2,4-trimethylbenzene, and benzyl chloride according to SW-846 Method 8260C;
 - Full TCL SVOCs, including 1-methylnaphthalene, according to SW-846 Method 8270D;
 - Naphthalene and 1,4-Dioxane according to SW-846 8270D -SIM;
 - LMAs according to SW-846 method 8015C (DAI); and
 - Organochlorine pesticides β -BHC, 4,4'-DDD, and 4,4'-DDT according to SW-846 Method 8081B. In addition, the laboratory is assessing the feasibility of reporting additional compounds from the TCL pesticides list based on QA/QC samples and instrument calibration. If additional compounds are reported, a

revised laboratory report will be prepared, and a discussion of the results will be included in the 2nd Q 2016 Progress Report.

Locations of the groundwater monitoring wells are presented on **Figure 4**. Results from this sampling event will be included in the 2nd Q 2016 Progress Report.

2.4 Site-Wide

On March 10, 2016, BMSMC and USEPA representatives held a meeting at the Humacao facility to discuss the recently submitted *Release Assessment Report* and the proposed sampling and analysis scope of work.

As noted in **Section 1**, on January 27, 2016, BMSMC submitted a Release Notification Letter to the USEPA that identified certain constituents present in groundwater that are currently not being addressed under the Corrective Action Program.

On February 26, 2016, BMSMC submitted a *Release Assessment Report* to the USEPA that identified specific constituents as new compounds of potential concern (COPCs) in the site's SWMUs.

On March 25, 2016, BMSMC submitted a *Release Assessment Sampling and Analysis Plan*, including an updated *Quality Assurance Project Plan* (QAPP), to complete a groundwater and soil investigation to evaluate potential release(s) of COPCs.

3.0 Summary of Findings

This section present a summary of findings based on groundwater samples collected during the 4th Q 2015 and validated during the 1st Q 2016.

3.1 Former Tank Farm Area

Groundwater samples were not collected from the FTF Area during the 4th Q 2015.

As proposed in the July 2015 Response to USEPA Comments: on the July 2011 Corrective Measure Study, groundwater analytical results for samples collected in the FTF Area during 2015 are presented in **Table 1**. Results are grouped by monitoring well and COC for each sampling round conducted in the FTF Area during 2015.

Ethylbenzene and toluene results for samples collected in MW-17 and MW-18 are also provided in **Table 1**. November 2015 RSLs are also provided in **Table 1**.

From **Table 1**, the concentrations of each FTF COC were significantly below the November 2015 RSLs in all groundwater samples collected during 2015. In addition, the concentrations of ethylbenzene and toluene in MW-17 and MW-18 were significantly below their November 2015 RSLs.

3.2 Brule Area

Groundwater samples were not collected from the Brule Area during the 4th Q 2015.

3.3 Building 5 Area

The 4th Q 2015 groundwater sample results from the Building 5 Area were compared to the USEPA MCLs or the November 2015 USEPA Regional Screening Levels (RSLs) for tap water in cases where MCLs do not exist. MCLs and the November 2015 RSLs for tap water for the Building 5 Area are provided in the table below. For the November 2015 RSLs, the tap water based RSL for MIBK increased from 1,200 ug/L to 6,300 ug/L. The RSLs for all other Building 5 COCs remained the same.

Parameter	MCL (µg/L)	Tap Water RSL¹ (µg/L)
Benzene	5	--
Ethylbenzene	700	---
Toluene	1,000	---
Xylenes (total)	10,000	---
Acetone	---	14,000
MIBK	---	6,300
Isopropyl Alcohol	---	410
Methanol	---	20,000

The 4th Q 2015 groundwater sampling results identified the COCs ethylbenzene and xylenes, at concentrations in excess of MCLs or RSLs. MCLs for one or more COCs were exceeded in in-plume wells G-1R(3) (ethylbenzene and xylene), S-31R(2) (ethylbenzene), and S-32 (ethylbenzene and xylene).

The concentrations of acetone, benzene, ethylbenzene, MIBK, toluene, and xylene within the Area E soil removal area remain significantly less than their respective pre-removal concentrations. Overall concentrations of COCs in Building 5 Area monitoring wells located downgradient of Area E were consistent with past events.

¹ USEPA RSLs updated November 2015

In addition to Building 5 Area COCs, the laboratory identified MTBE in A-1R(4) at a concentration (102 ug/L) above the November 2015 Tap Water RSL (14 ug/L). This data has not been validated. No other compounds have been identified by the laboratory at concentrations above their respective MCL or November 2015 Tap Water RSL.

As proposed in the July 2015 Response to USEPA Comments on the July 2011 Corrective Measure Study, groundwater analytical results for samples collected in the Building 5 Area during 2015 are presented in **Table 2**. Results are grouped by monitoring well and COC for each sampling round conducted in the Building 5 Area during 2015.

Ethylbenzene, xylene, and isopropyl alcohol were the only COCs detected in groundwater samples collected in 2015 that exceeded their respective MCLs or November 2015 RSLs. The concentrations of all other Building 5 Area COCs were less than their respective MCL or November 2015 RSL in each groundwater sample collected in the Building 5 Area in 2015.

As proposed in the July 2015 Response to USEPA Comments, Mann-Kendall time series plots for the ethylbenzene and xylene concentration in centerline wells [A-1R(4), A-2R(2), G-1R(3), S-31R(2), and S-32] are presented in **Table 3** and **Table 4**, respectively.

Based on concentration data collected since the second quarter 2013 (after Area E removal activities), ethylbenzene concentrations in A-1R(4) and A-2R(2) exhibit a decreasing trend, ethylbenzene concentrations in G-1R(3) and S-31R(2) exhibit a stable trend, and ethylbenzene concentrations in and S-32 exhibit no trend. Xylene concentrations in A-1R(4) and A-2R(2) exhibit a decreasing trend, xylene concentrations in G-1R(3) probably exhibit a decreasing trend, xylene concentrations in S-31R(2) exhibit no trend, and xylene concentrations in S-32 exhibit a stable trend.

4.0 Summary of Changes Made

- No changes to the Corrective Action Program were made during this reporting period.

5.0 Summary of Public Participation Activities

- No public participation activities occurred during the 1st Q 2016.

6.0 Summary of Problems Encountered

- There were no problems encountered relating to the RCRA Corrective Action Program during this reporting period.

7.0 Changes in Personnel

- There were no changes in personnel during this reporting period.

8.0 Projected Work for Next Reporting Period

Work scheduled to be performed during the three month period from April 1, 2016 through June 30, 2016 is described in this section.

8.1 Site-Wide

- The Release Assessment Sampling and Analysis Plan will be implemented during the 2nd Quarter 2016. Field investigation activities will include soil and in-situ groundwater sampling, installation of new monitoring wells, and groundwater sampling. Soil and groundwater samples will be analyzed for an expanded list of analytical parameters that will include full TCL VOCs, full TCL SVOCs, 1,4-dioxane and naphthalene by SIM, full TCL LMAs, organochlorine pesticides (at select locations), volatile petroleum hydrocarbons, and extractable petroleum hydrocarbons.

8.2 Former Tank Farm Area

- The 1st Q 2016 groundwater results will be validated.
- The 2nd Q 2016 quarterly groundwater sampling event will be conducted in June 2016. Existing monitoring wells will be sampled for an expanded list of analytical parameters that will include full TCL VOCs, full TCL SVOCs, 1,4-dioxane and naphthalene by SIM, full TCL LMAs, volatile petroleum hydrocarbons, and extractable petroleum hydrocarbons.

8.3 Brule Area

- The 1st Q 2016 groundwater results will be validated.
- The 2nd Q 2016 quarterly groundwater sampling event will be conducted in June 2016. Existing monitoring wells will be sampled for an expanded list of analytical parameters that will include full TCL VOCs, full TCL SVOCs, 1,4-dioxane and naphthalene by SIM,

full TCL LMAs, volatile petroleum hydrocarbons, and extractable petroleum hydrocarbons.

8.4 Building 5 Area

- The 1st Q 2016 groundwater results will be validated.
- The 2nd Q 2016 quarterly groundwater sampling event will be conducted in June 2016. Existing monitoring wells will be sampled for an expanded list of analytical parameters that will include full TCL VOCs, full TCL SVOCs, 1,4-dioxane and naphthalene by SIM, full TCL LMAs, full TCL organochlorine pesticides, volatile petroleum hydrocarbons, and extractable petroleum hydrocarbons.
- Portable granular activated carbon (GAC) units will be installed in Building 30 in areas where elevated naphthalene concentrations were detected in indoor samples collected during the 1st Quarter of 2016. Indoor air confirmations samples will be collected in Building 30 in the 2nd Quarter 2016, approximately four weeks after the portable GAC units are deployed.

9.0 Additional Documentation

- Other than the documents listed in Section 1, no additional documents were prepared during this reporting period.

Tables

Table 1
Former Tank Farm Area 2015 Groundwater Analytical Results for COCs (ug/L)

COC	November 2015 MCL or Tapwater RSL	Q1-15	Q3-15
MW-3			
Acetone	14000	<10J	<10
Chloromethane	190	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	0.59J	1.9
MW-5			
Acetone	14000	<10J	6.1J
Chloromethane	190	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	27.7	11.4
MW-7			
Acetone	14000	<10J	<10
Chloromethane	190	0.48J	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	0.95J	32.3
MW-12			
Acetone	14000	NS	<10
Chloromethane	190	NS	<1
Ethylbenzene	700	NS	2.3
Methylene chloride	5	NS	<2
MIBK	6300	NS	<5
Toluene	1000	NS	0.19J
Xylene (total)	10000	NS	0.65J
MW-13			
Acetone	14000	<10J	<10
Chloromethane	190	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	<1	<1
MW-14			
Acetone	14000	<10	<10
Chloromethane	190	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	<1	0.61J
MW-15			
Acetone	14000	<10	<10
Chloromethane	190	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	<1	<1

Table 1
Former Tank Farm Area 2015 Groundwater Analytical Results for COCs (ug/L)

COC	November 2015 MCL or Tapwater RSL	Q1-15	Q3-15
MW-16			
Acetone	14000	<10	<10
Chloromethane	190	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Xylene (total)	10000	<1	<1
MW-17			
Acetone	14000	<10	<10
Chloromethane	190	<1	<1
Ethylbenzene	700	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Toluene	1000	<1	<1
Xylene (total)	10000	<1	<1
MW-18			
Acetone	14000	<10	<10
Chloromethane	190	<1	<1
Ethylbenzene	700	<1	<1
Methylene chloride	5	<2	<2
MIBK	6300	<5	<5
Toluene	1000	0.54J	0.31J
Xylene (total)	10000	5.9	2.4
Notes:			
NS - Well not sampled			

Table 2
Building 5 Area 2015 Groundwater Analytical Results for COCs (ug/L)

COC	November 2015 MCL or Tapwater RSL	Q1-15	Q2-15	Q3-15	Q4-15
A-1R(4)					
Acetone	14000	<25	14.8J	<250	<50
Benzene	5	4.1	4.9	<13	3.1
Ethylbenzene	700	431	356	2820	351
Isopropyl Alcohol	410	<100	<100	<100	<100
Methanol	20000	<200	<200	<200	<200
MIBK	6300	<13	<20	85.3J	45.3
Toluene	1000	1.4J	1.1J	49.1	5.6
Xylene (total)	10000	1400	1210	9490	1320
A-2R(2)					
Acetone	14000	<10	<10	<10	<10
Benzene	5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	700	2.4	3.6	19.9	<1
Isopropyl Alcohol	410	<100	<100	<100	<100
Methanol	20000	<200	<200	<200	<200
MIBK	6300	<5	<5	<5	<5
Toluene	1000	<1	<1	0.68J	<1
Xylene (total)	10000	7.8	7.1	89.8	0.49J
D-1R					
Acetone	14000	<10	NS	<10	NS
Benzene	5	<0.5	NS	<0.5	NS
Ethylbenzene	700	<1	NS	0.3J	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	<1	NS	0.65J	NS
E-1R					
Acetone	14000	<10	NS	<10	NS
Benzene	5	0.3J	NS	0.3J	NS
Ethylbenzene	700	<1	NS	<1	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	0.68J	NS	0.75J	NS
G-1R(3)					
Acetone	14000	<2000	<2000	<2000	<1000
Benzene	5	<100	<100	<100	<50
Ethylbenzene	700	24800	27200	28200	25300
Isopropyl Alcohol	410	<100	<100	<100	<100
Methanol	20000	<200	<200	<200	<200
MIBK	6300	<1000	<1000	<1000	<500
Toluene	1000	168J	154J	96J	109
Xylene (total)	10000	82300	87200	85300	79400

Table 2
Building 5 Area 2015 Groundwater Analytical Results for COCs (ug/L)

COC	November 2015 MCL or Tapwater RSL	Q1-15	Q2-15	Q3-15	Q4-15
S-29R					
Acetone	14000	<10	NS	<10	NS
Benzene	5	<0.5	NS	<0.5	NS
Ethylbenzene	700	<1	NS	<1	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	<1	NS	<1	NS
S-31R(2)					
Acetone	14000	<200	<200	<100	<200
Benzene	5	<10	<10	2.6J	<10
Ethylbenzene	700	2290	5660	3740	2470
Isopropyl Alcohol	410	<100	<100	<100	<100
Methanol	20000	<200	<200	<200	<200
MIBK	6300	<100	<100	<50	<100
Toluene	1000	<20	<20	<10	<20
Xylene (total)	10000	379	<20	<10	467
S-32					
Acetone	14000	<2000	<2000	<1000	<2500
Benzene	5	<100	<100	<50	<130
Ethylbenzene	700	49500	44500	44800	39800
Isopropyl Alcohol	410	<100	<100	<100	<100
Methanol	20000	<200	<200	<200	<200
MIBK	6300	<1000	<1000	<500	<1300
Toluene	1000	80.8J	68.5J	49.7J	70.1J
Xylene (total)	10000	81900	81800	72800	66900
S-33					
Acetone	14000	<10	<10	<10	<10
Benzene	5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	700	<1	<1	<1	1.9
Isopropyl Alcohol	410	<100	<100	<100	<100
Methanol	20000	<200	<200	<200	<200
MIBK	6300	<5	<5	<5	<5
Toluene	1000	<1	<1	<1	<1
Xylene (total)	10000	<1	<1	<1	6.2
S-34					
Acetone	14000	<10	NS	<10	NS
Benzene	5	<0.5	NS	<0.5	NS
Ethylbenzene	700	<1	NS	<1	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	<1	NS	<1	NS

Table 2
Building 5 Area 2015 Groundwater Analytical Results for COCs (ug/L)

COC	November 2015 MCL or Tapwater RSL	Q1-15	Q2-15	Q3-15	Q4-15
S-35					
Acetone	14000	<10	NS	<10	NS
Benzene	5	<0.5	NS	<0.5	NS
Ethylbenzene	700	<1	NS	<1	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	<1	NS	<1	NS
S-36					
Acetone	14000	<10	NS	<10	NS
Benzene	5	<0.5	NS	<0.5	NS
Ethylbenzene	700	<1	NS	<1	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	<1	NS	<1	NS
UP-1					
Acetone	14000	<10	5.2J	<10	<10
Benzene	5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	700	<1	0.31J	3.7	8.3
Isopropyl Alcohol	410	<100	1070	<100	<100
Methanol	20000	<200	602	<200	<200
MIBK	6300	<5	<5	<5	<5
Toluene	1000	<1	<1	<1	<1
Xylene (total)	10000	0.71J	0.89J	3.7	2.2
UP-2					
Acetone	14000	<10	NS	<10	NS
Benzene	5	<0.5	NS	<0.5	NS
Ethylbenzene	700	<1	NS	<1	NS
Isopropyl Alcohol	410	<100	NS	<100	NS
Methanol	20000	<200	NS	<200	NS
MIBK	6300	<5	NS	<5	NS
Toluene	1000	<1	NS	<1	NS
Xylene (total)	10000	<1	NS	<1	NS

Notes:

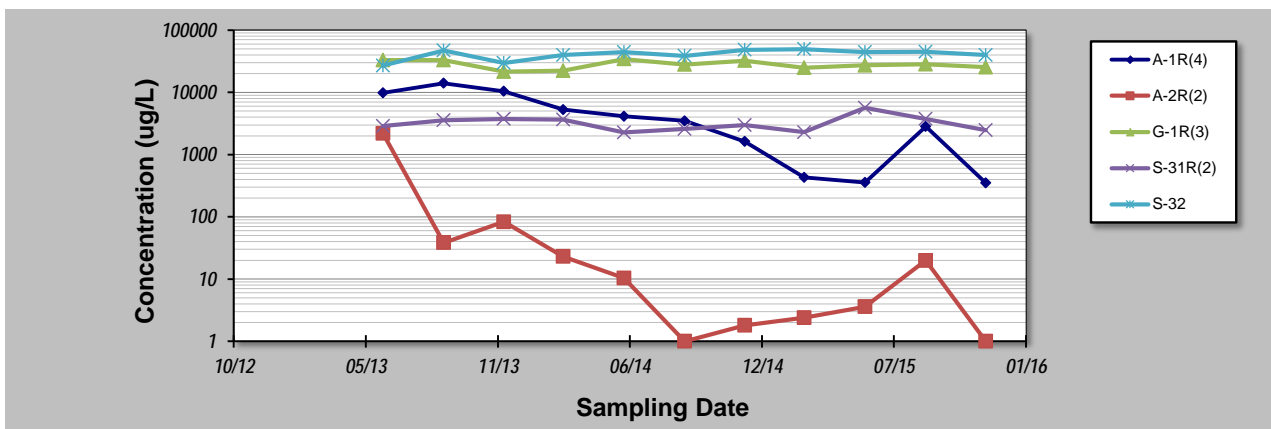
NS - Well not sampled during quarterly event

Concentrations that exceed the MCL or November 2015 Tapwater RSL are shown shaded.

Table 3
Mann-Kendall Results for Ethylbenzene - 2015 (Building 5 Area)

GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date:	14-Apr-16			Job ID:	Building 5 Area Groundwater Sampling Results			
Facility Name:	BMS Humacao, PR			Constituent:	Ethylbenzene			
Conducted By:	Addison Rice			Concentration Units:	ug/L			
Sampling Point ID:		A-1R(4)	A-2R(2)	G-1R(3)	S-31R(2)	S-32		
Sampling Event	Sampling Date	ETHYLBENZENE CONCENTRATION (ug/L)						
1	1-Jun-13	9790	2200	33000	2870	26900		
2	1-Sep-13	14000	38.4	32900	3570	47200		
3	1-Dec-13	10400	83.3	21600	3740	29800		
4	1-Mar-14	5270	23.1	22200	3660	39800		
5	1-Jun-14	4110	10.4	34300	2260	44600		
6	1-Sep-14	3480	1	28000	2580	38700		
7	1-Dec-14	1630	1.8	32300	2990	48300		
8	1-Mar-15	431	2.4	24800	2290	49500		
9	1-Jun-15	356	3.6	27200	5660	44500		
10	1-Sep-15	2820	19.9	28200	3740	44800		
11	1-Dec-15	351	1	25300	2470	39800		
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.97	3.04	0.16	0.30	0.18		
Mann-Kendall Statistic (S):		-45	-30	-9	0	16		
Confidence Factor:		>99.9%	99.0%	72.9%	45.1%	87.5%		
Concentration Trend:		Decreasing	Decreasing	Stable	Stable	No Trend		



Notes:

- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
- Confidence in Trend = Confidence (in percent) that constituent concentration is increasing ($S > 0$) or decreasing ($S < 0$): $>95\%$ = Increasing or Decreasing; $\geq 90\%$ = Probably Increasing or Probably Decreasing; $< 90\%$ and $S > 0$ = No Trend; $< 90\%$, $S \leq 0$, and $COV \geq 1$ = No Trend; $< 90\%$ and $COV < 1$ = Stable.
- Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

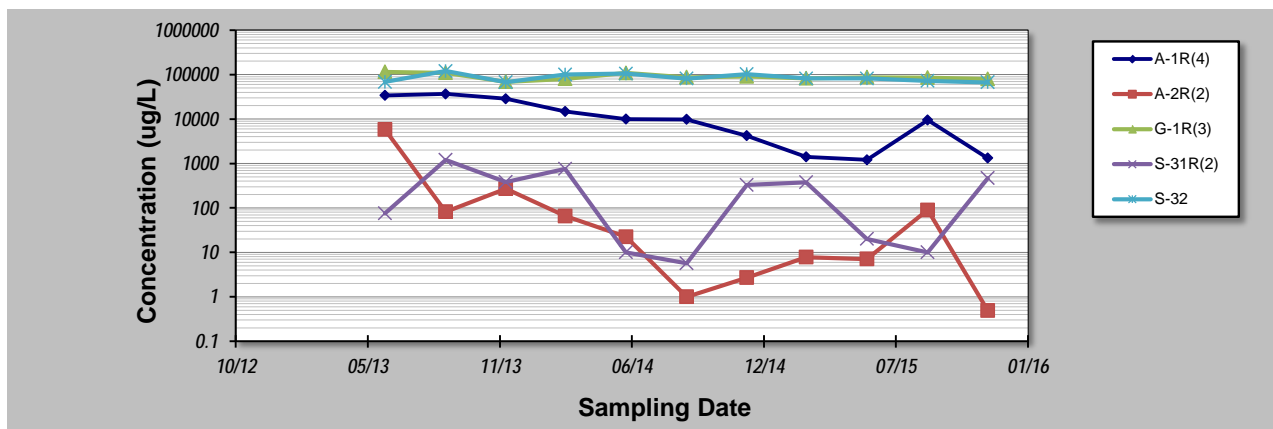
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Table 4
Mann-Kendall Results for Xylenes - 2015 (Building 5 Area)

GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date:	14-Apr-16				Job ID:	Building 5 Area Groundwater Sampling Results			
Facility Name:	BMS Humacao, PR				Constituent:	Total Xylenes			
Conducted By:	Addison Rice				Concentration Units:	ug/L			
Sampling Point ID:		A-1R(4)	A-2R(2)	G-1R(3)	S-31R(2)	S-32			
Sampling Event	Sampling Date	TOTAL XYLENES CONCENTRATION (ug/L)							
1	1-Jun-13	33900	5790	115000	75.8	68200			
2	1-Sep-13	36800	82.2	110000	1210	120000			
3	1-Dec-13	28500	270	68500	381	67200			
4	1-Mar-14	14700	65.9	80200	761	100000			
5	1-Jun-14	10000	22.5	109000	10	105000			
6	1-Sep-14	9860	1	87000	5.7	81100			
7	1-Dec-14	4230	2.7	91000	330	102000			
8	1-Mar-15	1400	7.8	82300	379	81900			
9	1-Jun-15	1210	7.1	87200	20	81800			
10	1-Sep-15	9490	89.8	85300	10	71900			
11	1-Dec-15	1320	0.49	79400	467	66900			
12									
13									
14									
15									
16									
17									
18									
19									
20									
Coefficient of Variation:		0.96	3.00	0.16	1.15	0.21			
Mann-Kendall Statistic (S):		-45	-29	-19	-10	-15			
Confidence Factor:		>99.9%	98.7%	91.8%	75.3%	85.9%			
Concentration Trend:		Decreasing	Decreasing	Prob. Decreasing	No Trend	Stable			



Notes:

- At least four independent sampling events per well are required for calculating the trend. Methodology is valid for 4 to 40 samples.
- Confidence in Trend = Confidence (in percent) that constituent concentration is increasing ($S > 0$) or decreasing ($S < 0$): $>95\%$ = Increasing or Decreasing; $\geq 90\%$ = Probably Increasing or Probably Decreasing; $< 90\%$ and $S > 0$ = No Trend; $< 90\%$, $S \leq 0$, and $COV \geq 1$ = No Trend; $< 90\%$ and $COV < 1$ = Stable.
- Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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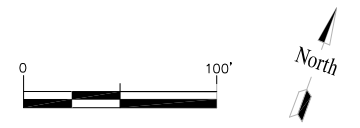
Figures



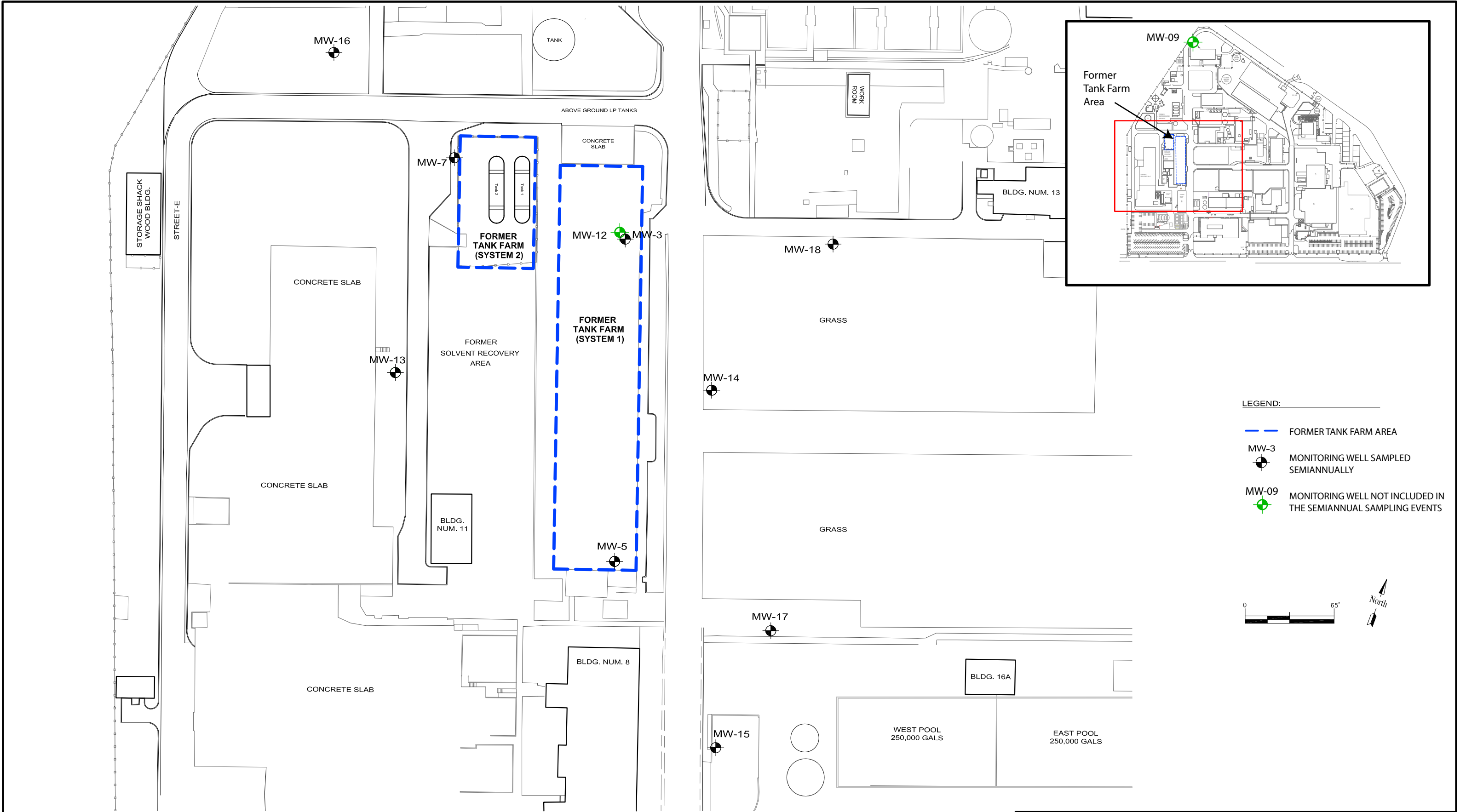
LEGEND

S-36
● MONITORING WELL

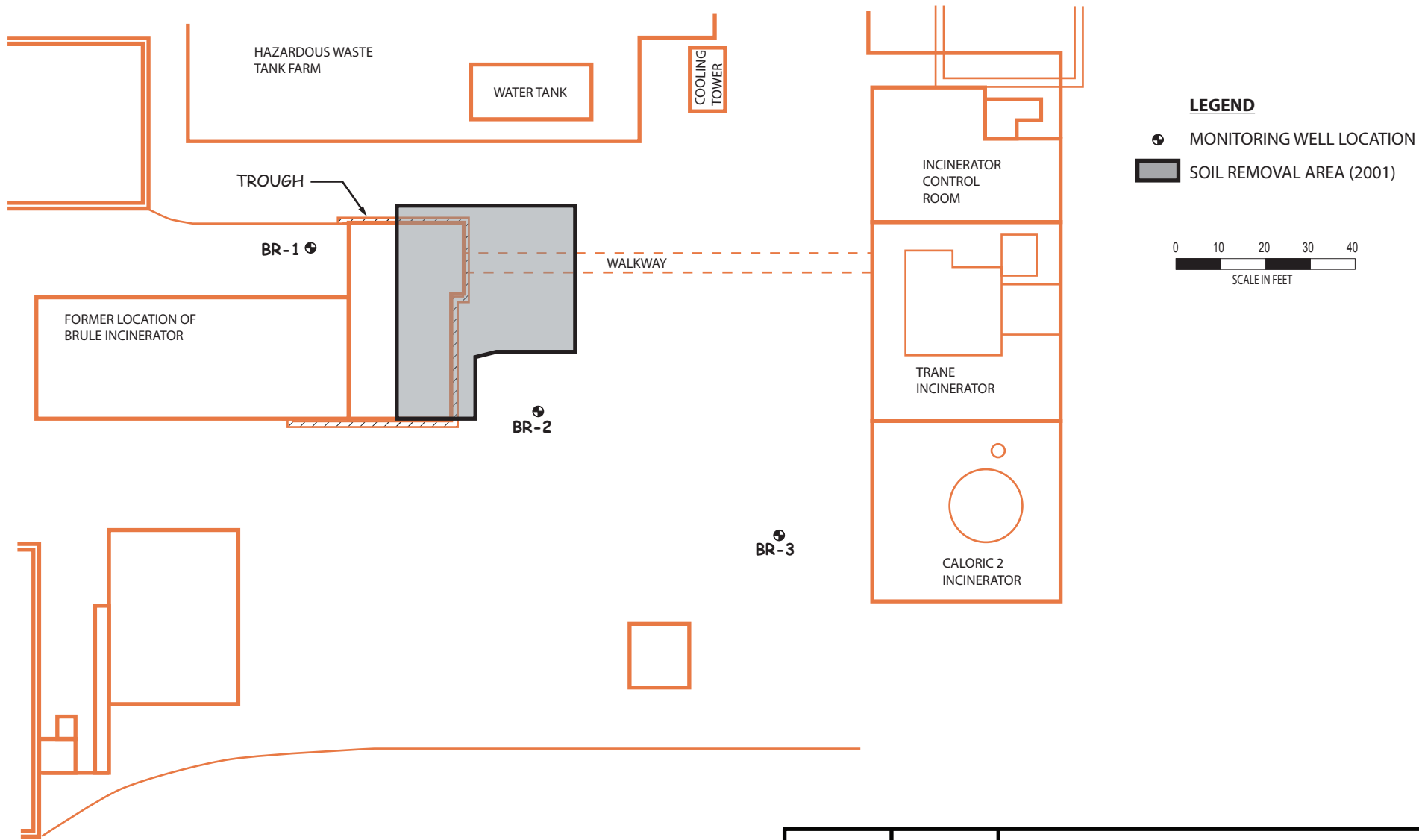
A
EXCAVATION AREA



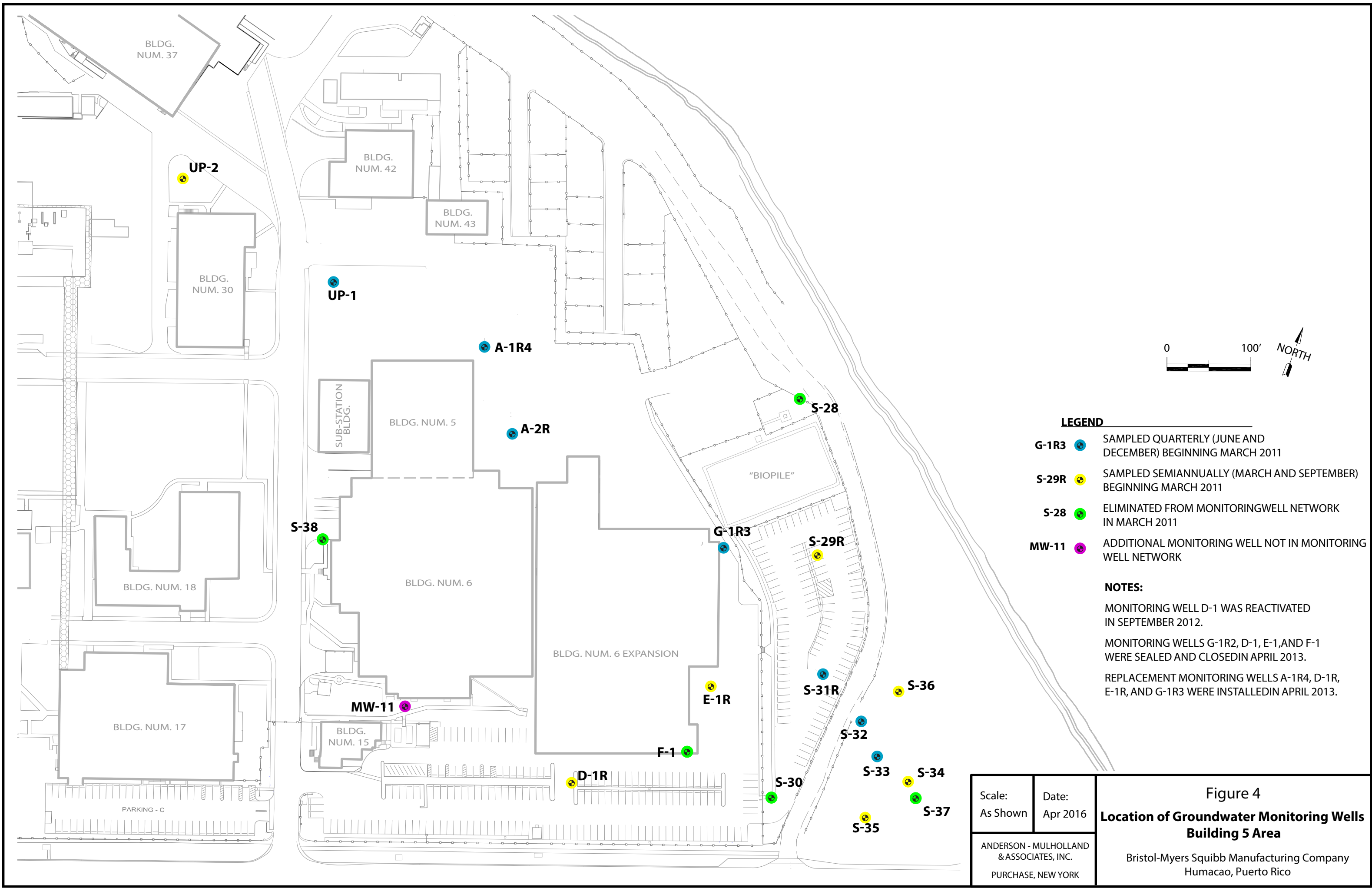
Scale: As Shown	Date: Apr 2016	<p align="center">Figure 1</p> <p align="center">Soil Excavation Areas</p> <p align="center">Building 5 Area</p> <p align="center">Bristol-Myers Squibb Manufacturing Company</p> <p align="center">Humacao, Puerto Rico</p>
<p align="center">ANDERSON - MULHOLLAND & ASSOCIATES, INC.</p> <p align="center">WHITE PLAINS, NEW YORK</p>		



Scale	Date	Figure 2 Location of Groundwater Monitoring Wells Former Tank Farm Area Bristol-Myers Squibb Manufacturing Company Humacao, Puerto Rico
	Apr 2016	
ANDERSON - MULHOLLAND & ASSOCIATES, INC. WHITE PLAINS, NEW YORK SAN JUAN, PUERTO RICO		



Scale: As Shown	Date: Apr 2016	<p>Figure 3</p> <p>Location of Groundwater Monitoring Wells Brule Area</p> <p>Bristol-Myers Squibb Manufacturing Company Humacao, Puerto Rico</p>
<p>ANDERSON - MULHOLLAND & ASSOCIATES, INC. PURCHASE, NEW YORK</p>		



Attachment A
Response to EPA Comments on the
RCRA Corrective Action Program
Quarterly Progress Report No. 62 1st Quarter 2016

Bristol-Myers Squibb Manufacturing Company
Humacao, Puerto Rico

December 16, 2016



Bristol-Myers Squibb Manufacturing Company

Humacao Operations
P.O. Box 609
Humacao, Puerto Rico 00792-0609
Tel. (787) 852-1255

VIA FEDERAL EXPRESS

December 16, 2016

Carmen Guerrero, Director
U.S. Environmental Protection Agency
Caribbean Environmental Protection Division
City View Plaza Suite 7000 #48 165 RD Km 1.2
Guaynabo, P.R. 00968-8019

**RE: Response to EPA Comments on the RCRA Corrective Action Program
Quarterly Progress Report No. 62 1st Quarter 2016
Bristol-Myers Squibb Manufacturing Company
Humacao, Puerto Rico
EPA Facility ID Number PRD090021056**

Dear Ms. Guerrero:

Enclosed please find a hard copy and one digital copy of Bristol-Myers Squibb Manufacturing Company's (BMSMC) response to United States Environmental Protection Agency (EPA) technical review and comments on the *RCRA Corrective Action Program Quarterly Progress Report No. 62 1st Quarter 2016*. The enclosed document has been prepared in response to EPA comments dated October 27, 2016 and received by BMSMC on November 2, 2016. The Response to Comments is due on December 17, 2016.

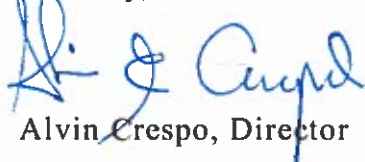
BMSMC has evaluated the Agency's technical comments and has provided a response to each comment provided by the Agency. The responses are included as Attachment A to this cover letter.

I, the undersigned, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for

gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please feel free to call me at (787) 656-4364 or Mr. Francisco Burgos, Environmental Affairs Manager, at (787) 656-4471 if you have any questions.

Cordially,



Alvin Crespo, Director

Environmental, Health and Safety

C: Mrs. Socorro Martínez, USEPA-CEPD
Mr. Ramón Torres, USEPA-CEPD
Ms. Amy Chester, USEPA Region 2
Ms. Gloria Toro, PREQB
Ms. Nilda del Mar Sánchez, PREQB
RCRA Record Center, USEPA Region 2

I. COMMENTS

1. The March 2016 Release Assessment Report (RAR) identified several new potential constituents of concern (COCs) at Tank Farm Area (SWMU No. 3), the Former Brule Incinerator Area (SWMU No. 9), and the Building 5 Area (SWMU No. 20). The ongoing quarterly groundwater sampling program at these SWMUs should be expanded to analyze for the full list of volatile organic compounds as well as 1,4-dioxane/naphthalene. This revision is necessary to incorporate and evaluate the newly identified COCs. Note that the ongoing quarterly groundwater sampling will also need to be further evaluated and revised for additional SWMUs or COCs as the Release Assessment data becomes available. Finally, these revisions may require that BMSMC's RCRA Hazardous Waste Treatment and Storage Permit No. PRD090021056 be modified as necessary.

BMSMC Response:

BMSMC is in agreement with the Agency's position that a permit modification would most likely be necessary to incorporate into the permit newly identified Constituents of Concern, Solid Waste Management Units, and/or new groundwater monitoring wells to the facility groundwater monitoring network. As noted by the agency, BMSMC is currently implementing ongoing monitoring activities which will determine which permit additions would be necessary. This determination will be made in coordination with the Agency in order to address this, and any other, Agency concerns or recommendations. Regarding the inclusion of the full list of volatile organic compounds as well as 1,4-dioxane/naphthalene in the ongoing quarterly reports for the Tank Farm Area (SWMU No. 3), the Former Brule Incinerator Area (SWMU No. 9), and the Building 5 Area (SWMU No. 20), BMSMC has already expanded the list of compounds to be analyzed during Quarterly on-site sampling events to include the referenced compounds, as well as other compounds that have been identified during the course of the investigation. The June data has been included in the 3rd Quarter 2016 Progress Report and the September data will be included in the 4th Quarter 2016 Progress Report.

2. The vapor intrusion sample analytical results are provided in an attachment (Attachment B on CD) and consist of the laboratory summary sheets. It is recommended that BMSMC compile the data and provide vapor intrusion sample

analytical result tables in the body of the report similar to the data tables provided for the 2015 Groundwater Analytical Results.

BMSMC Response:

BMSMC has included sub-slab and indoor air summary tables for Building 8, Building 30, and Building 42 for October 2015 and Building 30 and Building 42 for January 2016 (no vapor intrusion samples were collected at Building 8 in January 2016) as **Attachment 1** to this Response to Comments. Sub-slab and indoor sample locations for Building 8, Building 30, and Building 42 (**Figure 1**, **Figure 2**, and **Figure 3**, respectively) are also provided in **Attachment 1**.

BMSMC began compiling the vapor intrusion data and providing sample analytical results in the main body of the quarterly progress reports in a similar format to the groundwater tables in Quarterly Progress Report #63. BMSMC will continue to provide vapor intrusion investigation results in a similar fashion going forward as requested by the Agency (see also Quarterly Progress Report #64 for additional vapor intrusion results).

Section 2.3, Building 5 Area, Pages 6-7

3. The text indicates that the data from the second round of vapor intrusion sampling in Building 30 and Building 42 from January 2016 can be found in Attachment B. Upon review of Attachment B, the data is actually from the first round of vapor intrusion sampling in Building 30 and Building 42 that was conducted in October 2015. Attachment B should be updated to include the second round of vapor intrusion sampling. Additionally, both rounds of vapor intrusion data should be summarized in the data tables (see General Comment #2) in this progress report.

BMSMC Response:

The January 2016 vapor intrusion data for Building 30 and Building 42 as noted by USEPA was inadvertently not included in Attachment B to Quarterly Progress Report #62. BMSMC has included a CD containing the January 2016 vapor intrusion data for Building 30 and Building 42 *Attachment B (rev. December 2016): January 2016 Vapor Intrusion*

Response to EPA Comments on the RCRA Corrective Action Program
Quarterly Progress Report No. 62 1st Quarter 2016
Bristol-Myers Squibb Manufacturing Company
Humacao, Puerto Rico

Laboratory Analytical and Data Validation Reports as **Attachment 2** to
this Response to Comments

The vapor intrusion data collected at the BMSMC facility between August 2015 – July 2016, including the October 2015 and January 2016 results, is also presented in the *Supplemental Vapor Intrusion Report Buildings 7, 8, 15, 18, 30, 42* (AMAI, September 2016) which was previously submitted to the Agency.

Attachment 1

Tables

Table 1
Building 8 Indoor Air Sample Results
October 2015

Parameter	Commercial Target Indoor Air Screening Level	B8IA-2	B8IA-2D	B8AA-1 ¹
		10/18/2015	10/18/2015	10/18/2015
Former Tank Farm Area COCs (ug/m ³)				
Acetone	140000	22 J	9 J	12
Chloromethane	390	2	1.9	2.1
Methyl Isobutyl Ketone	13000	0.39 J	<0.72	<0.65
Methylene chloride	1200	0.87 JJ	0.44 JJ	0.53 J
Total Xylenes	440	0.81 J	0.75 J	0.98 J
Methane (%)	0.5	0.00021	0.00022	0.0002
Other TO-15 Compounds (ug/m ³)				
1,1,1-Trichloroethane	22000	<0.86	<0.96	<0.86
1,1,2,2-Tetrachloroethane	0.21	<1.1	<1.2	<1.1
1,1,2-Trichloroethane	0.77	<0.86	<0.96	<0.86
1,1-Dichloroethane	7.7	<0.64	<0.72	<0.64
1,1-Dichloroethene	880	<0.62	<0.7	<0.63
1,2,4-Trichlorobenzene	8.8	<5.8 J	<6.6 J	<5.9 J
1,2,4-Trimethylbenzene	31	0.31 J	<0.87	0.27 J
1,2-Dibromoethane (EDB)	0.02	<1.2	<1.4	<1.2
1,2-Dichlorobenzene	880	<0.94	<1.1	<0.95
1,2-Dichloroethane	0.47	<0.64	<0.72	<0.64
1,2-Dichloropropane	1.2	<0.72	<0.82	<0.73
1,3,5-Trimethylbenzene	---	<0.77	<0.87	<0.78
1,3-Butadiene	0.41	<0.35	<0.39	<0.35
1,3-Dichlorobenzene	---	<0.94	<1.1	<0.95
1,4-Dichlorobenzene	1.1	<0.94	<1.1	<0.95
1,4-Dioxane	2.5	<0.56	<0.64	<0.57
2,2,4-Trimethylpentane	---	0.22 J	0.19 J	1 J
2-Butanone (Methyl Ethyl Ketone)	22000	5.8 J	1.9 JJ	1.7 J
2-Hexanone	130	0.99 J	<3.6	<3.2
3-Chloropropene	2	<2.4	<2.8	<2.5
4-Ethyltoluene	---	0.26 J	0.29 J	<0.78
alpha-Chlorotoluene	0.25	<4.1	<4.6	<4.1
Benzene	1.6	0.32 J	<0.56	0.44 J
Bromodichloromethane	0.33	<1	<1.2	<1
Bromoform	11	<1.6	<1.8	<1.6
Bromomethane	22	<3	<3.4	<3.1
Carbon disulfide	3100	0.48 JJ	<2.8 J	<2.5
Carbon tetrachloride	2	0.55 J	0.45 J	0.55 J
Chlorobenzene	220	<0.72	<0.81	<0.73
Chloroethane	44000	<2.1	<2.3	<2.1
Chloroform	0.53	<0.77	<0.86	<0.77
cis-1,2-Dichloroethene	---	<0.62	<0.7	<0.63
cis-1,3-Dichloropropene	---	<0.71	<0.8	<0.72
Cumene	1800	<0.77 J	0.41 JJ	<0.78

Table 1
Building 8 Indoor Air Sample Results
October 2015

Parameter	Commercial Target Indoor Air Screening Level	B8IA-2	B8IA-2D	B8AA-1 ¹
		10/18/2015	10/18/2015	10/18/2015
Cyclohexane	26000	0.32 J	<0.61	<0.54
Dibromochloromethane	---	<1.3	<1.5	<1.3
Ethanol	---	2.9	2.9	3.1
Ethylbenzene	4.9	<0.68	<0.77	0.27 J
Freon 11	---	1.2	1.1	1.3
Freon 113	130000	<1.2	<1.4	0.6 J
Freon 114	---	<1.1	<1.2	<1.1
Freon 12	440	1.9 J	2.3 J	2.6 J
Heptane	---	0.62 JJ	0.31 JJ	1.6
Hexachlorobutadiene	0.56	<8.4	<9.4	<8.4
Hexane	3100	0.73	0.8	2.2
Isopropyl Alcohol	880	1.7 JJ	0.91 JJ	1.2 J
Methanol	88000	<100	<120	<100
Methyl tert-butyl ether	47	<0.57	<0.64	<0.57
Naphthalene	0.36	<4.1	<4.6	<4.1
Propylbenzene	4400	<0.77	<0.87	<0.78
Styrene	4400	<0.67	<0.75	<0.67
Tetrachloroethene	47	<1.1	<1.2	<1.1
Tetrahydrofuran	8800	<2.3	<2.6	<2.3
Toluene	22000	0.99	1	1.1
trans-1,2-Dichloroethene	---	<0.62	<0.7	<0.63
trans-1,3-Dichloropropene	---	<0.71	<0.8	<0.72
Trichloroethene	3	<0.84	<0.95	<0.85
Vinyl chloride	2.8	<0.4	<0.45	<0.4

Notes:

¹ Sample B8AA-1 was an ambient air sample collected upwind of Building 8.

Detected results are shown in bold. Values which exceed the screening level are shown shaded.

---: The USEPA has not developed a vapor intrusion screening level for this parameter.

J: Indicates an estimated value

JJ: Indicates field duplicate precision criteria was not met.

Table 2
Building 8 Sub-Slab Soil Gas Sample Results
October 2015

Parameter	Commercial Target Sub-slab Screening Level	B8SSV-2	B8SSV-2D
		10/10/2015	10/10/2015
Former Tank Farm Area COCs (ug/m ³)			
Acetone	4500000	<380	<370
Chloromethane	13000	<330	<320
Methyl Isobutyl Ketone	440000	<160	<160
Methylene chloride	41000	38 J	43 J
Total Xylenes	15000	1060 J	1010 J
Methane (%)	0.5	59	60
Other TO-15 Compounds (ug/m ³)			
1,1,1-Trichloroethane	730000	<220	<210
1,1,2,2-Tetrachloroethane	7	<280	<270
1,1,2-Trichloroethane	26	<220	<210
1,1-Dichloroethane	260	<160	<160
1,1-Dichloroethene	29000	<160	<160
1,2,4-Trichlorobenzene	290	<1200	<1200
1,2,4-Trimethylbenzene	1000	87 J	91 J
1,2-Dibromoethane	0.68	<310	<300
1,2-Dichlorobenzene	29000	<240	<240
1,2-Dichloroethane	16	<160	<160
1,2-Dichloropropane	41	<190	<180
1,3,5-Trimethylbenzene	---	120 J	100 J
1,3-Butadiene	14	<90	<87
1,3-Dichlorobenzene	---	<240	<240
1,4-Dichlorobenzene	37	<240	<240
1,4-Dioxane	82	<580	<570
2,2,4-Trimethylpentane	---	960	970
2-Butanone (Methyl Ethyl Ketone)	730000	<480	<460
2-Chlorotoluene	---	NS	NS
2-Hexanone	4400	<660	<640
3-Chloropropene	68	<510	<490
4-Ethyltoluene	---	160 J	150 J
alpha-Chlorotoluene	8.3	<210	<200
Benzene	52	64 J	62 J
Bromodichloromethane	11	<270	<260
Bromoethene	13	NS	NS
Bromoform	370	<420	<410
Bromomethane	730	<160	<150
Carbon disulfide	100000	<130	<120
Carbon tetrachloride	68	<250	<250
Chlorobenzene	7300	<190	<180
Chloroethane	1500000	<430	<420
Chloroform	18	<200	<190
cis-1,2-Dichloroethene	---	58 J	55 J
cis-1,3-Dichloropropene	---	<180	<180
Cumene	58000	16000	16000

Table 2
Building 8 Sub-Slab Soil Gas Sample Results
October 2015

Parameter	Commercial Target Sub-slab Screening Level	B8SSV-2	B8SSV-2D
		10/10/2015	10/10/2015
Cyclohexane	880000	6700	6800
Dibromochloromethane	---	<340	<340
Ethanol	---	<300	<300
Ethyl Acetate	10000	NS	NS
Ethylbenzene	160	220	230
Freon 11	---	<230	<220
Freon 113	4400000	<310	<300
Freon 114	---	<280	<280
Freon 12	15000	<200	<190
Heptane	---	9400	9600
Hexachlorobutadiene	19	<1700	<1700
Hexane	100000	3000	3000
Isopropyl Alcohol	29000	<400	<390
Methyl tert-butyl ether	1600	850	850
Methylmethacrylate	100000	NS	NS
n-Butane	---	NS	NS
Naphthalene	12	<850	<820
Propane	---	NS	NS
Propylbenzene	150000	2100	2100
Propylene	440000	NS	NS
Styrene	150000	<170	<170
Tertiary Butyl Alcohol	---	NS	NS
Tetrachloroethene	1600	<270	<270
Tetrahydrofuran	290000	<120	<120
Toluene	730000	<150	<150
trans-1,2-Dichloroethene	---	<160	<160
trans-1,3-Dichloropropene	---	<180	<180
Trichloroethene	100	<220	<210
Vinyl Acetate	29000	NS	NS
Vinyl chloride	93	89 J	98 J

Notes:

Detected results are shown in bold. Values which exceed the screening level are shown shaded.

---: The USEPA has not developed a vapor intrusion screening level for this parameter.

NS: No Sample Results

J: Indicates an estimated value

E: Indicates detected concentration exceeded the calibration range of the instrument

Table 3
Building 30 Indoor Air Sample Results
October 2015 and January 2016

Parameter	Commercial Target Indoor Air Screening Level	B30IA-1		B30IA-2		B30IA-3		B30IA-4				B30IA-5		B3042AA ¹	B30AA ²
		10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	10/18/2015 D	1/31/2016	1/31/2016 D	10/18/2015	1/31/2016	10/18/2015	1/31/2016
		Building 5 Area COCs (ug/m ³)													
Benzene	1.6	1.5	0.7	0.29 J	0.33 J	0.3 J	0.28 J	0.32 J	0.35 J	0.29 J	0.34 J	0.41 J	0.3 J	<0.6	0.24 J
Ethylbenzene	4.9	4.9	<0.79	<0.72	<0.74	<0.75	<0.78	0.71	0.47 J	<0.63	<0.87	0.52 J	<0.81	0.36 J	<0.83
Toluene	22000	35	1.1	1.8	1.1	1.2	0.86	4 J	1.7 J	0.79	0.91	3.7	1.1	2.2	0.29 J
Total Xylenes	440	19.8	0.37 J	0.96 J	0.38 J	0.70 J	0.33 J	2.26	1.54 J	0.52 J	0.41 J	2.25 J	0.36 J	1.4 J	<0.83
Acetone	140000	130	12	42	8.5	13	13	30 J	20 J	11	18 J	23	10	19	8.1
Methyl Isobutyl Ketone	13000	1.4	<0.75	0.73	<0.7	0.22 J	0.23 J	0.4 JJ	2.9 J	<0.6	0.43 J	0.42 J	<0.77	0.28 J	<0.78
Isopropyl Alcohol	880	61	26	39	25	32	19	32	29	21	22	22	14	3.3	0.51 J
Methanol	88000	<110	<120	<110	<110	<110	<120	<100	<99	<96	<130	<110	<120	<120	<120
Methane (%)	0.5	0.00023	0.00027	0.00032	0.00027	0.00029	0.00024	0.00028	0.00028	0.00023	0.00023	0.00027	0.00021	0.0002	0.0002
		Other TO-15 Compounds (ug/m ³)													
1,1,1-Trichloroethane	22000	<0.9	<1	<0.91	<0.93	<0.94	<0.98	<0.87	<0.82	<0.8	<1.1	<0.92	<1	<1	<1
1,1,2,2-Tetrachloroethane	0.21	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1	<1	<1	<1.4	<1.2	<1.3	<1.3	<1.3
1,1,2-Trichloroethane	0.77	<0.9	<1	<0.91	<0.93	<0.94	<0.98	<0.87	<0.82	<0.8	<1.1	<0.92	<1	<1	<1
1,1-Dichloroethane	7.7	<0.67	<0.74	<0.68	<0.69	<0.7	<0.72	<0.65	<0.61	<0.59	<0.81	<0.68	<0.76	<0.76	<0.77
1,1-Dichloroethene	880	<0.66	<0.72	<0.66	<0.68	<0.68	<0.71	<0.63	<0.6	<0.58	<0.8	<0.67	<0.74	<0.74	<0.76
1,2,4-Trichlorobenzene	8.8	<6.2 J	<6.8	<6.2 J	<6.3	<6.4 J	<6.6	<5.9 J	<5.6 J	1.3 J	<7.4	<6.3 J	<6.9	<7 J	<7.1
1,2,4-Trimethylbenzene	31	0.87	<0.9	0.34 J	0.22 J	0.23 J	<0.88	0.3 JJ	0.62 JJ	0.19 J	0.34 J	0.44 J	<0.92	<0.92	<0.94
1,2-Dibromoethane (EDB)	0.02	<1.3	<1.4	<1.3	<1.3	<1.3	<1.4	<1.2	<1.2	<1.1	<1.5	<1.3	<1.4	<1.4	<1.5
1,2-Dichlorobenzene	880	<1	<1.1	<1	<1	<1	<1.1	<0.96	<0.91	0.19 J	<1.2	<1	<1.1	<1.1	<1.1
1,2-Dichloroethane	0.47	0.31 J	<0.74	0.28 J	<0.69	<0.7	<0.72	<0.65	0.21 J	0.15 J	<0.81	0.12 J	<0.76	<0.76	<0.77
1,2-Dichloropropane	1.2	3.3	<0.84	<0.77	<0.79	<0.79	<0.83	0.31 J	<0.7	<0.67	<0.93	<0.78	<0.86	<0.87	<0.88
1,3,5-Trimethylbenzene	---	0.26 J	<0.9	0.17 J	<0.84	<0.84	<0.88	<0.79	0.23 J	<0.72	<0.99	0.19 J	<0.92	<0.92	<0.94
1,3-Butadiene	0.41	0.18 J	0.16 J	<0.37	<0.38	<0.38	<0.4	<0.35	<0.33	<0.32	<0.44	<0.37	<0.41	<0.42	<0.42
1,3-Dichlorobenzene	---	<1	<1.1	<1	<1	<1	<1.1	<0.96	<0.91	0.14 J	<1.2	<1	<1.1	<1.1	<1.1
1,4-Dichlorobenzene	1.1	<1	<1.1	<1	0.21 J	<1	<1.1	<0.96	0.51 J	0.25 J	0.25 J	<1	<1.1	<1.1	0.22 J
1,4-Dioxane	2.5	<0.6	<0.66	<0.6	<0.62	<0.62	<0.64	<0.58	<0.54	<0.53	<0.72	<0.61	<0.67	<0.68	<0.69
2,2,4-Trimethylpentane	---	3.8 J	<4.3	0.3 J	<4	<4	<4.2	0.2 J	0.26 J	<3.4	<4.7	0.2 J	<4.4	0.54 J	<4.5
2-Butanone (Methyl Ethyl Ketone)	22000	19	2.3 J	9.5	1.2 J	2 J	1.5 J	3.4	3.6	1.2 J	4 J	2.7	1.6 J	4.8	1.1 J
2-Hexanone	130	1.3 J	<3.7	1.6 J	<3.5	<3.5	<3.7	<3.3	0.69 J	<3	1.1 J	<3.5	<3.8	<3.8	<3.9
3-Chloropropene	2	<2.6	<2.9	<2.6	<2.7	<2.7	<2.8	<2.5	<2.4	<2.3	<3.1	<2.6	<2.9	<2.9	<3
4-Ethyltoluene	---	1.1	0.11 J	0.22 J	0.15 J	0.26 J	0.12 J	0.27 J	0.54 J	0.15 J	0.2 J	0.3 J	0.14 J	<0.92	<0.94
alpha-Chlorotoluene	0.25	<4.3	0.11 J	<4.3	<0.88	<4.4	<0.93	<4.1	<3.9	0.18 J	<1	<4.4	<0.97	<4.9	<0.99
Bromodichloromethane	0.33	<1.1	<1.2	<1.1	<1.1	<1.2	<1.2	<1.1	<1	<0.98	<1.3	<1.1	<1.2	<1.2	<1.3
Bromoform	11	<1.7	<1.9	<1.7	<1.8	<1.8	<1.8	<1.6	<1.6	<1.5	<2.1	<1.7	<1.9	<1.9	<2
Bromomethane	22	<3.2	<3.6	<3.2	<3.3	<3.3	<3.5	<3.1	<2.9	<2.8	<3.9	<3.3	<3.6	<3.6	<3.7
Carbon Disulfide	3100	2.9	1.3 J	0.36 J	4.4	<2.7	1.5 J	0.49 J	0.59 J	1.9 J	1.5 J	<2.6	1.8 J	<2.9	0.99 J
Carbon Tetrachloride	2	0.39 J	0.46 J	0.37 J	0.41 J	0.53 J	0.42 J	0.42 J	0.33 J	0.41 J	0.47 J	0.31 J	0.43 J	0.69 J	0.48 J
Chlorobenzene	220	0.15 J	<0.84	<0.77	<0.79	<0.79	<0.82	<0.74	<0.7	<0.67	<0.92	<0.78	<0.86	<0.86	<0.88
Chloroethane	44000	<2.2	<2.4	<2.2	<2.2	<2.3	<2.4	<2.1	<2	<1.9	<2.6	<2.2	<2.5	<2.5	<2.5
Chloroform	0.53	0.31 J	<0.89	<0.82	<0.83	<0.84	<0.87	<0.78	<0.74	<0.71	<0.98	<0.82	<0.91	<0.92	<0.93
Chloromethane	390	1.9	1.3 J	1.6 J	1.2 J	1.5 J	1.4 J	1.9	1.9	1.4 J	1.4 J	1.6 J	1.3 J	2.1	1.4 J
cis-1,2-Dichloroethene	---	<0.66	<0.72	<0.66	<0.68	<0.68	<0.71	<0.63	<0.6	<0.58	<0.8	<0.67	<0.74	<0.74	<0.76
cis-1,3-Dichloropropene	---	<0.75	<0.83	<0.76	<0.78	<0.78	<0.81	<0.73	<0.68	<0.66	<0.91	<0.77	<0.85	<0.85	<0.87
Cumene	1800	0.56 J	<0.9	<0.82	<0.84	<0.84	<0.88	<0.79	<0.74	<0.72	<0.99	<0.83	<0.92	<0.92	<0.94

Table 3
Building 30 Indoor Air Sample Results
October 2015 and January 2016

Parameter	Commercial Target Indoor Air Screening Level	B30IA-1		B30IA-2		B30IA-3		B30IA-4				B30IA-5		B3042AA ¹	B30AA ²
		10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	10/18/2015 D	1/31/2016	1/31/2016 D	10/18/2015	1/31/2016	10/18/2015	1/31/2016
Cyclohexane	26000	2.2	<0.63	0.23 J	<0.59	<0.59	<0.62	0.44 J	<0.52	<0.5	<0.69	<0.58	<0.64	<0.65	<0.66
Dibromochloromethane	---	<1.4	<1.6	<1.4	<1.4	<1.5	<1.5	<1.4	<1.3	<1.2	<1.7	<1.4	<1.6	<1.6	<1.6
Ethanol	---	48	24	15	21	9.2	28	11	10	41 J0 J	46 J0 J	9.7	31	4.9	4 J0J
Freon 11	---	1.5	1.3	1.2	1.3	1.4	1.3	1.4	1.4	1.3	1.4	1.3	1.3	1.3	1.1
Freon 113	130000	<1.3	0.46 JJ	<1.3	0.37 JJ	<1.3	0.42 JJ	<1.2	0.49 J	0.45 J	0.37 J	0.57 J	0.38 JJ	0.72 J	0.43 J
Freon 114	---	<1.2	<1.3	<1.2	<1.2	<1.2	<1.2	<1.1	<1	<1	<1.4	<1.2	<1.3	<1.3	<1.3
Freon 12	440	2.3 J	2.1	1.8 J	1.9	2 J	2	2.2 J	2.2 J	2.1	2	1.2 J	2	1.8 J	2
Heptane	---	11	0.47 J	0.94	<0.7	0.29 J	<0.73	0.84	0.65	<0.6	0.44 J	0.77	<0.77	0.88	<0.78
Hexachlorobutadiene	0.56	<8.8	<9.8 J	<8.9	<9.1 J	<9.2	<9.5 J	<8.5	<8	<7.8	<11	<9	<10 J	<10	<10
Hexane	3100	12	0.43 J	0.97	<0.6	0.62	<0.63	1.3 J	0.83 J	<0.51	0.48 J	0.99	<0.66	1.6	<0.67
Methyl tert-butyl ether	47	0.23 J	<0.66	<0.6	<0.62	<0.62	<0.64	<0.58	<0.54	<0.53	<0.72	<0.61	<0.67	<0.68	<0.69
Methylene Chloride	1200	9.7	0.29 J	0.57 J	0.42 J	1.2	0.24 J	2.3	2.3	0.24 J	<1.4	1.1 J	0.26 J	0.92 J	<1.3
Naphthalene (TO-15)	0.36	<4.4	<4.8	<4.4	0.33 J	<4.5	<4.7	2.6 JJ	1.6 J	0.22 J	<5.3	<4.4	<4.9	<4.9	<5
Naphthalene (TO-17)	0.36	NS	0.54	NS	0.077 J	NS	0.095	NS	NS	0.16	0.18	NS	0.082	NS	<0.068
Propylbenzene	4400	<0.82	<0.9	<0.82	<0.84	<0.84	<0.88	<0.79	<0.74	<0.72	<0.99	<0.83	<0.92	<0.92	<0.94
Styrene	4400	10	0.16 J	0.22 J	0.2 J	0.4 J	0.22 J	0.87 J	0.39 JJ	0.26 J	0.26 J	1	0.37 J	0.52 J	<0.81
Tetrachloroethene	47	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1	<1	<0.99	<1.4	<1.1	<1.3	<1.3	<1.3
Tetrahydrofuran	8800	3.2	<2.7	<2.5	<2.5	<2.5	<2.6	<2.4	<2.2	<2.2	<3	<2.5	<2.8	<2.8	<2.8
trans-1,2-Dichloroethene	---	<0.66	<0.72	<0.66	<0.68	<0.68	<0.71	<0.63	<0.6	<0.58	<0.8	<0.67	<0.74	<0.74	<0.76
trans-1,3-Dichloropropene	---	<0.75	<0.83	<0.76	<0.78	<0.78	<0.81	<0.73	<0.68	0.16 J	<0.91	<0.77	<0.85	<0.85	<0.87
Trichloroethene	3	0.27 J	<0.98	<0.9	<0.92	1.3	<0.96	<0.86	1	<0.78	<1.1	<0.91	<1	<1	<1
Vinyl Chloride	2.8	<0.42	<0.47	<0.43	<0.44	<0.44	<0.46	<0.41	<0.38	<0.37	<0.51	<0.43	<0.48	<0.48	<0.49

Notes:

¹ Sample B3042AA was an ambient air sample collected upwind of Building 30 and Building 42.

² Sample B30AA was an ambient air sample collected upwind of Building 30.

Detected results are shown in bold. Values which exceed the screening level are shown shaded.

---: The USEPA has not developed a vapor intrusion screening level for this parameter.

NS: No Sample Results

J: Indicates an estimated value

JJ: Indicates field duplicate precision criteria was not met.

J0: Indicates an estimated value due to bias in the CCV

Table 4
Building 30 Sub-Slab Soil Gas Sample Results
October 2015 and January 2016

Parameter	Commercial Target Sub-slab Screening Level	B30SSV-1				B30SSV-2			B30SSV-3			B30SSV-4						B30SSV-5	
		TO-15			TO-17														
		10/10/2015	10/27/2015	1/31/2016	1/31/2016	10/9/2015	10/27/2015	1/31/2016	10/10/2015	10/28/2015	1/31/2016	10/9/2015	10/9/15 D	10/27/2015	10/27/2015 D	1/31/2016	1/31/2016 D	10/9/2015	1/31/2016
		Building 5 Area COCs (ug/m ³)																	
Benzene	52	NS	1700 J	<13000	680	NS	190	<3.7	NS	4.3	<4	NS	NS	1.8 J	<3	NS	<27	NS	<3.4
Ethylbenzene	160	NS	280000	61000	6200 EJ	NS	14 J	<5	NS	<5	<5.4	NS	NS	<4	<5	NS	16 J	NS	<4.7
Toluene	730000	NS	<4400	<15000	44	NS	9.1 J	0.89 J	NS	3.6 J	0.91 J	NS	NS	2.1 JJ	1.6 JJ	NS	30 J	NS	3.4 J
Total Xylenes	15000	NS	3059000	1936000	97600 SJ	NS	50 J	<5	NS	5.0 J	<5.4	NS	NS	2.4 J	<5	NS	68 J	NS	1.4 J
Acetone	4500000	NS	<11000	<38000	NS	NS	46 J	20 J	NS	57	18 J	NS	NS	50 J	49 J	NS	110 J	NS	18 J
Methyl Isobutyl Ketone	440000	NS	<4800	<16000	<20	NS	6.7 J	<4.8	NS	4 J	<5.1	NS	NS	1.1 JJ	2.2 JJ	NS	<35	NS	<4.4
Isopropyl Alcohol	29000	NS	<11000	<39000	NS	NS	24 J	23	NS	24	24	NS	NS	52 J	300 J	NS	3600	NS	61
Methanol	2900000	<150	NS	<16000	NS	<150	NS	<150	<150	NS	<160	<150	<150	NS	NS	NS	<170	<160	<140
Methane (%)	0.5	9.3	NS	48	NS	0.25	NS	0.00029	0.14	NS	0.00066	0.00022 J	0.00021 J	NS	NS	NS	0.00018 J	0.0002 J	0.00022
		Other TO-15 Compounds (ug/m ³)																	
1,1,1-Trichloroethane	730000	NS	<6400	<22000	<14	NS	<25	<6.3	NS	<6	<6.8	NS	NS	1.7 J	<6	NS	<46	NS	<5.9
1,1,2,2-Tetrachloroethane	7	NS	<8000	<27000	<17	NS	<31	<8	NS	1.7 J	<8.6	NS	NS	<7	<8	NS	<58	NS	<7.4
1,1,2-Trichloroethane	26	NS	<6400	<22000	<14	NS	<25	<6.3	NS	<6	<6.8	NS	NS	<6	<6	NS	<46	NS	<5.9
1,1-Dichloroethane	260	NS	<4700	<16000	39	NS	<18	<4.7	NS	<4	<5.1	NS	NS	<4	<4	NS	<34	NS	<4.4
1,1-Dichloroethene	29000	NS	<4600	<16000	74	NS	<18	<4.6	NS	<4	<5	NS	NS	<4	<4	NS	<34	NS	<4.3
1,2,4-Trichlorobenzene	290	NS	<34000	<120000 JJ	<38	NS	<140	<34	NS	<35	<37	NS	NS	<34	<36	NS	<250	NS	<32
1,2,4-Trimethylbenzene	1000	NS	<5700	<20000	26 J	NS	<22	<5.7	NS	1.5 J	<6.2	NS	NS	1.6 JJ	<5 J	NS	<42	NS	<5.3
1,2-Dibromoethane (EDB)	0.68	NS	<9000	<30000	NS	NS	<35	<8.9	NS	<9	<9.6	NS	NS	<8	<9	NS	<65	NS	<8.3
1,2-Dichlorobenzene	29000	NS	<7000	<24000	<15	NS	<28	<7	NS	<7	<7.5	NS	NS	<6	<7	NS	<51	NS	<6.5
1,2-Dichloroethane	16	NS	<4700	<16000	<10	NS	<18	<4.7	NS	<4	<5.1	NS	NS	<4	<4	NS	<34	NS	<4.4
1,2-Dichloropropane	41	NS	<5400	<18000	<12	NS	<21	<5.4	NS	<5	<5.8	NS	NS	<5	<5	NS	<39	NS	<5
1,3,5-Trimethylbenzene	---	NS	<5700	<20000	7.5 J	NS	<22	<5.7	NS	<5	<6.2	NS	NS	<5	<5	NS	<42	NS	<5.3
1,3-Butadiene	14	NS	<2600	<8800	<5.5	NS	<10	<2.6	NS	<2	<2.8	NS	NS	<2	<2	NS	<19	NS	<2.4
1,3-Dichlorobenzene	---	NS	<7000	<24000	49	NS	<28	<7	NS	<7	<7.5	NS	NS	<6	<7	NS	48 J	NS	<6.5
1,4-Dichlorobenzene	37	NS	<7000	<24000	<15	NS	<28	<7	NS	<7	<7.5	NS	NS	<6	<7	NS	<51	NS	<6.5
1,4-Dioxane	82	NS	<17000	<57000	<28	NS	<66	<17	NS	3.4 J	<18	NS	NS	<16	<17	NS	<120	NS	3 J
2,2,4-Trimethylpentane	---	NS	<5400	<18000	56	NS	120	0.79 J	NS	3.2 J	<5.9	NS	NS	<5	<5	NS	8.9 J	NS	1 J
2-Butanone (Methyl Ethyl Ketone)	730000	NS	<14000	<47000	NS	NS	10 J	4.6 J	NS	18	<15	NS	NS	11 J	8.8 J	NS	51 J	NS	3.8 J
2-Hexanone	4400	NS	<19000	<65000	<20	NS	<75	<19	NS	11 J	<20	NS	NS	2.9 J	2 J	NS	<140	NS	<18
3-Chloropropene	68	NS	<14000	<50000	NS	NS	<57	<14	NS	<15	<16	NS	NS	<14	<15	NS	<110	NS	<13
4-Ethyltoluene	---	NS	<5700	<20000	<24	NS	<22	<5.7	NS	<5	<6.2	NS	NS	<5	<5	NS	10 J	NS	<5.3
alpha-Chlorotoluene	8.3	NS	<6000	<21000	NS	NS	<24	<6	NS	<6	<6.5	NS	NS	<5	<6	NS	<44	NS	<5.6
Bromodichloromethane	11	NS	<7800	<27000	NS	NS	<31	<7.8	NS	<8	<8.4	NS	NS	<7	<8	NS	<57	NS	<7.2
Bromoform	370	NS	<12000	<41000	NS	NS	<47	<12	NS	<12	<13	NS	NS	<12	<12	NS	<88	NS	<11
Bromomethane	730	NS	<4500	<15000	NS	NS	<180	<45	NS	<46	<49	NS	NS	<44	<47	NS	<330	NS	<42
Carbon Disulfide	100000	NS	<3600	<12000	NS	NS	8.6 J	<14	NS	2.2 J	<16	NS	NS	9.3 J	1.7 J	NS	<100	NS	2.7 J
Carbon Tetrachloride	68	NS	<7300	<25000	<16	NS	<29	<7.3	NS	<7	<7.9	NS	NS	<7	<7	NS	<53	NS	<6.8
Chlorobenzene	7300	NS	<5400	<18000	<12	NS	13 J	<5.3	NS	<5	<5.8	NS	NS	<5	<5	NS	<39	NS	<4.9
Chloroethane	1500000	NS	<12000	<42000	NS	NS	<48	<12	NS	<12	<13	NS	NS	<12	<13	NS	<90	NS	<11
Chloroform	18	NS	<5700	<19000	<12	NS	<22	<5.7	NS	<5	<6.1	NS	NS	<5	<5	NS	<42	NS	<5.2
Chloromethane	13000	NS	<9600	<33000	NS	NS	<94	<24	NS	<24	<26	NS	NS	<24	2.6 J	NS	<180	NS	<22
cis-1,2-Dichloroethene	---	NS	<4600	<16000	55	NS	8.8 J	<4.6	NS	<4	<5	NS	NS	<4	<4	NS	<34	NS	<4.3
cis-1,3-Dichloropropene	---	NS	<5300	<18000	NS	NS	<21	<5.3	NS	<5	<5.7	NS	NS	<5	<5	NS	<38	NS	<4.9
Cumene	58000	NS	1300 J	<20000	13 J	NS	7.1 J	<5.7	NS	<5	<6.2	NS	NS	<5	<5	NS	<42	NS	<5.3

Table 4
Building 30 Sub-Slab Soil Gas Sample Results
October 2015 and January 2016

Parameter	Commercial Target Sub-slab Screening Level	B30SSV-1				B30SSV-2			B30SSV-3			B30SSV-4						B30SSV-5	
		TO-15			TO-17														
		10/10/2015	10/27/2015	1/31/2016	1/31/2016	10/9/2015	10/27/2015	1/31/2016	10/10/2015	10/28/2015	1/31/2016	10/9/2015	10/9/15 D	10/27/2015	10/27/2015 D	1/31/2016	1/31/2016 D	10/9/2015	1/31/2016
Cyclohexane	880000	NS	2200 J	2800 J	2600 EJ	NS	<16	<4	NS	21	<4.3	NS	NS	<3	<4	NS	<29	NS	1.7 J
Dibromochloromethane	---	NS	<9900	<34000	NS	NS	<39	<9.9	NS	<10	<11	NS	NS	<9	<10	NS	<72	NS	<9.2
Ethanol	---	NS	<8800	<30000	NS	NS	75	14	NS	43	16	NS	NS	190 J	65 J	NS	3000	NS	48
Freon 11	---	NS	<6500	<22000	<28	NS	<26	1.4 J	NS	<6	1.6 J	NS	NS	3.9 J	2.8 J	NS	<48	NS	1.4 J
Freon 113	4400000	NS	<8900	<30000	<19	NS	<35	<8.9	NS	1.6 J	<9.6	NS	NS	1.8 J	<9	NS	<65	NS	<8.2
Freon 114	---	NS	<8100	<28000	<35	NS	<32	<8.1	NS	<8	<8.8	NS	NS	<8	<8	NS	<59	NS	<7.5
Freon 12	15000	NS	<5800	<20000	NS	NS	<23	2.4 J	NS	1.8 J	3.1 J	NS	NS	3.6 J	4.4 J	NS	<42	NS	2.8 J
Heptane	---	NS	<4800	<16000	560	NS	17 J	2.8 J	NS	3.9 J	3 J	NS	NS	2 J	<5	NS	<35	NS	2.8 J
Hexachlorobutadiene	19	NS	<50000	<170000	<52	NS	<200	<49	NS	<51	<54	NS	NS	<49	<52	NS	<360	NS	<46
Hexane	100000	NS	2100 J	<14000	3200 EJ	NS	64	<4.1	NS	3.4 J	<4.4	NS	NS	2 JJ	<4 J	NS	<30	NS	<3.8
Isopentane (TO-17)	---	NS	NS	NS	920	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methyl tert-butyl ether	1600	NS	<4200	<14000	NS	NS	4.4 J	<4.2	NS	0.8 J	<4.5	NS	NS	<4	<4	NS	<31	NS	<3.9
Methylcyclohexane (TO-17)	---	NS	NS	NS	370	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methylene Chloride	41000	NS	<4000	<14000	38 J	NS	<160	<40	NS	4.5 J	<44	NS	NS	2.8 J	4.5 J	NS	<300	NS	<37
Naphthalene (TO-15)	12	NS	<24000	<83000	NS	NS	<48	<12	NS	0.62 J	<13	NS	NS	0.36 JJ	0.3 JJ	NS	<89	NS	<11
Naphthalene (TO-17)	12	NS	NS	NS	1.5 J	NS	NS	<2.5	NS	NS	<2.5	NS	NS	NS	NS	<2.5	<2.5	NS	<2.5
Propylbenzene	150000	NS	<5700	<20000	5.6 J	NS	<22	<5.7	NS	<5	<6.2	NS	NS	<5	<5	NS	<42	NS	<5.3
Styrene	150000	NS	<5000	<17000	<21	NS	<20	<4.9	NS	<5	<5.3	NS	NS	<4 J	<5 J	NS	6.2 J	NS	<4.6
Tetrachloroethene	1600	NS	<7900	<27000	5.3 J	NS	<31	<7.9	NS	3.2 J	<8.5	NS	NS	5.3 J	3.1 J	NS	<58	NS	<7.3
Tetrahydrofuran	290000	NS	<3400	<12000	NS	NS	<14	<3.4	NS	2.9 J	<3.7	NS	NS	1.1 J	0.83 J	NS	<25	NS	<3.2
trans-1,2-Dichloroethene	---	NS	<4600	<16000	11 J	NS	<18	<4.6	NS	<4	<5	NS	NS	<4	<4	NS	<34	NS	<4.3
trans-1,3-Dichloropropene	---	NS	<5300	<18000	NS	NS	<21	<5.3	NS	<5	<5.7	NS	NS	<5	<5	NS	<38	NS	<4.9
Trichloroethene	100	NS	<6300	<21000	7.8 J	NS	7.7 J	<6.2	NS	2.3 J	<6.7	NS	NS	<6	<6	NS	<46	NS	<5.8
Vinyl Chloride	93	NS	<3000	<10000	170	NS	<12	<3	NS	<3	<3.2	NS	NS	<2	<3	NS	<22	NS	<2.7

Notes:
Detected results are shown in bold. Values which exceed the screening level are shown shaded.
---: The USEPA has not developed a vapor intrusion screening level for this parameter.
NS: No Sample Results
J: Indicates an estimated value
JJ: Indicates field duplicate precision criteria was not met.
E: Indicates detected concentration exceeded the calibration range of the instrument
EJ: Indicates detected concentration exceeded the calibration range of the instrument. Value is estimated.
S: Indicates a saturated peak
SJ: Indicates a saturated peak. Value is estimated.
Methanol and methane results from the October 2015 sampling were reported from samples collected on October 9th and 10th.

Table 5
Building 42 Indoor Air Sample Results
October 2015 and January 2016

Parameter	Commercial	B42IA-1		B42IA-2		B42IA-3		B3042AA ¹	B30AA ²
	Target Indoor Air								
	Screening Level	10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	1/31/2016
Building 5 Area COCs (ug/m ³)									
Benzene	1.6	0.5 J	0.39 J	0.31 J	0.59	0.35 J	0.26 J	<0.6	0.24 J
Ethylbenzene	4.9	0.66 J	0.27 J	<0.68	0.36 J	<0.63	<0.74	0.36 J	<0.83
Toluene	22000	3	2.1	2.3	4	1.5	1.2	2.2	0.29 J
Total Xylenes	440	2.98	1.2 J	1.58 J	1.43 J	1.38 J	0.38 J	1.4 J	<0.83
Acetone	140000	25	9.8	12	20	12	17	19	8.1
Methyl Isobutyl Ketone	13000	<0.69	0.3 J	0.25 J	0.28 J	0.29 J	0.24 J	0.28 J	<0.78
Isopropyl Alcohol	880	2.9	0.78 J	1.3 J	5.9	2.9	2.6	3.3	0.51 J
Methanol	88000	<110	<130	<100	<120	<96	<110	<120	<120
Methane	0.5	0.0002	0.00018 J	0.0002	0.00021	0.0002	0.00019	0.0002	0.0002
Other TO-15 Compounds (ug/m ³)									
1,1,1-Trichloroethane	22000	<0.92	<1.1	<0.86	<0.98	<0.8	<0.93	<1	<1
1,1,2,2-Tetrachloroethane	0.21	<1.2	<1.3	<1.1	<1.2	<1	<1.2	<1.3	<1.3
1,1,2-Trichloroethane	0.77	<0.92	<1.1	<0.86	<0.98	<0.8	<0.93	<1	<1
1,1-Dichloroethane	7.7	<0.68	<0.79	<0.64	<0.72	<0.59	<0.69	<0.76	<0.77
1,1-Dichloroethene	880	<0.67	<0.78	<0.62	<0.71	<0.58	<0.68	<0.74	<0.76
1,2,4-Trichlorobenzene	8.8	<6.2 J	<7.3	<5.8 J	<6.6	<5.4 J	<6.3	<7 J	<7.1
1,2,4-Trimethylbenzene	31	0.75 J	0.35 J	0.36 J	0.34 J	0.34 J	<0.84	<0.92	<0.94
1,2-Dibromoethane (EDB)	0.02	<1.3	<1.5	<1.2	<1.4	<1.1	<1.3	<1.4	<1.5
1,2-Dichlorobenzene	880	<1	<1.2	<0.94	<1.1	<0.88	<1	<1.1	<1.1
1,2-Dichloroethane	0.47	<0.68	<0.79	<0.64	<0.72	<0.59	<0.69	<0.76	<0.77
1,2-Dichloropropane	1.2	<0.78	<0.9	<0.72	0.44 J	<0.67	<0.79	<0.87	<0.88
1,3,5-Trimethylbenzene	---	0.38 J	<0.96	<0.77	<0.88	0.21 J	<0.84	<0.92	<0.94
1,3-Butadiene	0.41	<0.37	<0.43	<0.35	0.11 J	<0.32	<0.38	<0.42	<0.42
1,3-Dichlorobenzene	---	<1	<1.2	<0.94	<1.1	<0.88	<1	<1.1	<1.1
1,4-Dichlorobenzene	1.1	0.64 J	<1.2	<0.94	<1.1	<0.88	<1	<1.1	0.22 J
1,4-Dioxane	2.5	<0.6	<0.71	<0.56	<0.64	<0.53	<0.62	<0.68	<0.69
2,2,4-Trimethylpentane	---	0.52 J	<4.6	0.31 J	<4.2	1.5 J	0.96 J	0.54 J	<4.5
2-Butanone (Methyl Ethyl Ketone)	22000	6	2.1 J	2.2 J	4.1	1.7 J	3.2	4.8	1.1 J
2-Hexanone	130	<3.4	<4	<3.2	<3.7	<3	<3.5	<3.8	<3.9
3-Chloropropene	2	<2.6	<3.1	<2.4	<2.8	<2.3	<2.7	<2.9	<3
4-Ethyltoluene	---	0.56 J	0.38 J	0.36 J	0.34 J	0.35 J	0.18 J	<0.92	<0.94
alpha-Chlorotoluene	0.25	<4.3	<1	<4.1	<0.93	<3.8	<0.88	<4.9	<0.99
Bromodichloromethane	0.33	<1.1	<1.3	<1	<1.2	<0.98	<1.1	<1.2	<1.3
Bromoform	11	<1.7	<2	<1.6	<1.8	<1.5	<1.8	<1.9	<2
Bromomethane	22	<3.3	<3.8	<3	<3.5	<2.8	<3.3	<3.6	<3.7
Carbon Disulfide	3100	22	1.3 J	<2.4	1.4 J	<2.3	1.2 J	<2.9	0.99 J
Carbon Tetrachloride	2	0.73 J	0.46 J	0.49 J	0.37 J	0.41 J	0.44 J	0.69 J	0.48 J
Chlorobenzene	220	<0.77	<0.9	<0.72	<0.82	<0.67	<0.79	<0.86	<0.88
Chloroethane	44000	<2.2	<2.6	<2.1	<2.4	<1.9	<2.2	<2.5	<2.5
Chloroform	0.53	<0.82	<0.96	<0.77	<0.87	<0.71	<0.83	<0.92	<0.93
Chloromethane	390	1.9	1.3 J	1.5 J	1.4 J	1.6	1.3 J	2.1	1.4 J
cis-1,2-Dichloroethene	---	<0.67	<0.78	<0.62	<0.71	<0.58	<0.68	<0.74	<0.76
cis-1,3-Dichloropropene	---	<0.76	<0.89	<0.71	<0.81	<0.66	<0.78	<0.85	<0.87
Cumene	1800	<0.82	<0.96	0.13 J	<0.88	<0.72	<0.84	<0.92	<0.94

Table 5
Building 42 Indoor Air Sample Results
October 2015 and January 2016

Parameter	Commercial Target Indoor Air Screening Level	B42IA-1		B42IA-2		B42IA-3		B3042AA ¹	B30AA ²
		10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	1/31/2016	10/18/2015	1/31/2016
Cyclohexane	26000	0.36 J	<0.67	0.3 J	0.38 J	0.18 J	<0.59	<0.65	<0.66
Dibromochloromethane	---	<1.4	<1.7	<1.3	<1.5	<1.2	<1.4	<1.6	<1.6
Ethanol	---	10	5.5 J0 J	6.1	25 J0 J	12	18 J0 J	4.9	4 J0 J
Freon 11	---	1.3	1.1	1.2	1.1	1.1	0.98	1.3	1.1
Freon 113	130000	<1.3	0.44 J	0.5 J	0.41 J	0.5 J	0.44 J	0.72 J	0.43 J
Freon 114	---	<1.2	<1.4	<1.1	<1.2	<1	<1.2	<1.3	<1.3
Freon 12	440	3.6 J	2	2.6 J	2	2.7 J	2	1.8 J	2
Heptane	---	0.71	0.4 J	0.43 J	0.42 J	0.55 J	0.39 J	0.88	<0.78
Hexachlorobutadiene	0.56	<9	<10	<8.4	<9.5	<7.8	<9.1	<10	<10
Hexane	3100	1.4	0.51 J	0.82	1.9	0.98	<0.6	1.6	<0.67
Methyl tert-butyl ether	47	<0.6	<0.71	<0.57	<0.64	<0.53	<0.62	<0.68	<0.69
Methylene Chloride	1200	2.5	0.31 J	1.5	1.3	3.3	2	0.92 J	<1.3
Naphthalene (TO-15)	0.36	1.3 J	0.59 J	<4.1	0.19 J	<3.8	<4.5	<4.9	<5
Naphthalene (TO-17)	0.36	NS	0.12	NS	0.1	NS	0.091	NS	<0.068
Propylbenzene	4400	<0.82	<0.96	<0.77	<0.88	<0.72	<0.84	<0.92	<0.94
Styrene	4400	0.27 J	<0.83	0.17 J	0.27 J	0.17 J	<0.73	0.52 J	<0.81
Tetrachloroethene	47	<1.1	<1.3	<1.1	<1.2	<0.99	<1.2	<1.3	<1.3
Tetrahydrofuran	8800	2.3 J	1.2 J	<2.3	12	<2.2	4.2	<2.8	<2.8
trans-1,2-Dichloroethene	---	0.73	<0.78	<0.62	<0.71	<0.58	<0.68	<0.74	<0.76
trans-1,3-Dichloropropene	---	<0.76	<0.89	<0.71	<0.81	<0.66	<0.78	<0.85	<0.87
Trichloroethene	3	<0.9	<1	<0.84	0.88 J	<0.78	0.37 J	<1	<1
Vinyl Chloride	2.8	<0.43	<0.5	<0.4	<0.46	<0.37	<0.44	<0.48	<0.49

Notes:

¹ Sample B3042AA was an ambient air sample collected upwind of Building 30 and Building 42.

² Sample B30AA was an ambient air sample collected upwind of Building 30 and Building 42.

Detected results are shown in bold. Values which exceed the screening level are shown shaded.

---: The USEPA has not developed a vapor intrusion screening level for this parameter.

NS: No Sample Results

J: Indicates an estimated value

J0: Indicates an estimated value due to bias in the continuing calibration verification.

Table 6
Building 42 Sub-Slab Soil Gas Sample Results
October 2015 and January 2016

Parameter	Commercial Target Sub-slab Screening Level	B42SSV-1			B42SSV-2			B42SSV-3		
		10/10/2015	10/28/2015	1/31/2016	10/10/2015	10/28/2015	1/31/2016	10/10/2015	10/28/2015	1/31/2016
Building 5 Area COCs (ug/m ³)										
Benzene	52	NS	1.2 J	6 J	NS	11	<3.6	NS	1.4 J	<3.6
Ethylbenzene	160	NS	5.5	11 J	NS	<11	<4.9	NS	1.5 J	<4.9
Toluene	730000	NS	14	13 J	NS	7.5 J	1.4 J	NS	4.4	2.8 J
Total Xylenes	15000	NS	14.4 J	34 J	NS	4.4 J	<4.9	NS	4 J	4.1 J
Acetone	4500000	NS	56	84 J	NS	670	22 J	NS	110	20 J
Methyl Isobutyl Ketone	440000	NS	2 J	<19	NS	12	<4.6	NS	4.5 J	<4.6
Isopropyl Alcohol	29000	NS	20	2400	NS	110	12	NS	28	290
Methanol	2900000	<150	NS	<160	<150	NS	<150	<160	NS	<150
Methane	0.5	0.00011 J	NS	0.000071 J	0.0002 J	NS	0.00025	0.0002 J	NS	0.0002 J
Other TO-15 Compounds (ug/m ³)										
1,1,1-Trichloroethane	730000	NS	<6	<26	NS	<13	<6.2	NS	<6	<6.2
1,1,2,2-Tetrachloroethane	7	NS	<7	<32	NS	<17	<7.8	NS	<7	<7.8
1,1,2-Trichloroethane	26	NS	<6	<26	NS	<13	<6.2	NS	<6	<6.2
1,1-Dichloroethane	260	NS	<4	<19	NS	<9	<4.6	NS	<4	<4.6
1,1-Dichloroethene	29000	NS	<4	<19	NS	<9	<4.5	NS	<4	<4.5
1,2,4-Trichlorobenzene	290	NS	2.3 J	<140	NS	<72	<34	NS	<34	<34
1,2,4-Trimethylbenzene	1000	NS	1.5 J	<23	NS	<12	<5.6	NS	1.6 J	<5.6
1,2-Dibromoethane (EDB)	0.68	NS	<8	<36	NS	<19	<8.7	NS	<8	<8.7
1,2-Dichlorobenzene	29000	NS	<6	<28	NS	<15	<6.8	NS	<6	<6.8
1,2-Dichloroethane	16	NS	<4	<19	NS	<9	<4.6	NS	<4	<4.6
1,2-Dichloropropane	41	NS	<5	<22	NS	<11	<5.2	NS	<5	<5.2
1,3,5-Trimethylbenzene	---	NS	<5	<23	NS	<12	<5.6	NS	<5	<5.6
1,3-Butadiene	14	NS	<2	<10	NS	<5	<2.5	NS	<2	<2.5
1,3-Dichlorobenzene	---	NS	<6	46	NS	<15	<6.8	NS	<6	3.8 J
1,4-Dichlorobenzene	37	NS	<6	<28	NS	<15	<6.8	NS	2.3 J	<6.8
1,4-Dioxane	82	NS	3.3 J	<68	NS	<35	<16	NS	12 J	<16
2,2,4-Trimethylpentane	---	NS	1.1 J	5.1 J	NS	<11	<5.3	NS	<5	1 J
2-Butanone (Methyl Ethyl Ketone)	730000	NS	8.5 J	33 J	NS	120	3.9 J	NS	32	6.3 J
2-Hexanone	4400	NS	2.2 J	<78	NS	60	<18	NS	15 J	<18
3-Chloropropene	68	NS	<14	<59	NS	<31	<14	NS	<14	<14
4-Ethyltoluene	---	NS	3.7 J	6.5 J	NS	<12	<5.6	NS	<5	<5.6
alpha-Chlorotoluene	8.3	NS	<5	<24	NS	<13	<5.8	NS	<5	<5.9
Bromodichloromethane	11	NS	<7	<32	NS	<16	<7.6	NS	<7	<7.6
Bromoform	370	NS	<12	<49	NS	<25	<12	NS	<12	<12
Bromomethane	730	NS	<44	<180	NS	<95	<44	NS	<44	<44
Carbon Disulfide	100000	NS	15	<59	NS	2.7 J	3.6 J	NS	18	<14
Carbon Tetrachloride	68	NS	<7	<30	NS	<15	<7.1	NS	<7	<7.1
Chlorobenzene	7300	NS	<5	<22	NS	<11	<5.2	NS	<5	<5.2
Chloroethane	1500000	NS	<12	<50	NS	<26	<12	NS	<12	<12
Chloroform	18	NS	<5	<23	NS	<12	<5.5	NS	<5	<5.5
Chloromethane	13000	NS	<24	<98	NS	<50	<23	NS	<24	<23
cis-1,2-Dichloroethene	---	NS	<4	<19	NS	<9	<4.5	NS	<4	<4.5
cis-1,3-Dichloropropene	---	NS	<5	<22	NS	<11	<5.1	NS	<5	<5.2
Cumene	58000	NS	<5	<23	NS	<12	<5.6	NS	<5	<5.6

Table 6
Building 42 Sub-Slab Soil Gas Sample Results
October 2015 and January 2016

Parameter	Commercial Target Sub-slab Screening Level	B42SSV-1			B42SSV-2			B42SSV-3		
		10/10/2015	10/28/2015	1/31/2016	10/10/2015	10/28/2015	1/31/2016	10/10/2015	10/28/2015	1/31/2016
Cyclohexane	880000	NS	<3	<16	NS	<8	<3.9	NS	<3	<3.9
Dibromochloromethane	---	NS	<9	<40	NS	<21	<9.6	NS	<9	<9.7
Ethanol	---	NS	27	1300	NS	300	94	NS	150	290
Freon 11	---	NS	3.1 J	<27	NS	3.2 J	<6.3	NS	3.4 J	1.4 J
Freon 113	4400000	NS	<8	<36	NS	<19	<8.7	NS	1.2 J	<8.7
Freon 114	---	NS	<8	<33	NS	<17	<7.9	NS	<8	<7.9
Freon 12	15000	NS	4 J	<23	NS	5.4 J	3 J	NS	3.8 J	3 J
Heptane	---	NS	3.4 J	<19	NS	9.8 J	3 J	NS	2.4 J	2.5 J
Hexachlorobutadiene	19	NS	<49	<200	NS	<100	<48	NS	<49	<48
Hexane	100000	NS	1.6 J	<17	NS	4 J	<4	NS	2.2 J	<4
Methyl tert-butyl ether	1600	NS	<4	<17	NS	<8	<4.1	NS	<4	<4.1
Methylene Chloride	41000	NS	4.3 J	<160	NS	<85	<39	NS	4.4 J	<39
Naphthalene (TO-15)	12	NS	1.3 J	<50	NS	0.48 J	<12	NS	0.36 J	<12
Naphthalene (TO-17)	12	NS	NS	1.3 J	NS	NS	7.5	NS	NS	<2.5
Propylbenzene	150000	NS	<5	3.4 J	NS	<12	<5.6	NS	<5	<5.6
Styrene	150000	NS	1.2 J	3.8 J	NS	<10	<4.8	NS	3.7 J	<4.8
Tetrachloroethene	1600	NS	<7	<32	NS	<16	<7.7	NS	<7	<7.7
Tetrahydrofuran	290000	NS	2.1 J	<14	NS	7.2	12	NS	3.9	4.9
trans-1,2-Dichloroethene	---	NS	<4	<19	NS	<9	<4.5	NS	<4	<4.5
trans-1,3-Dichloropropene	---	NS	<5	<22	NS	<11	<5.1	NS	<5	<5.2
Trichloroethene	100	NS	2.3 J	<25	NS	6.9 J	<6.1	NS	<6	<6.1
Vinyl Chloride	93	NS	<2	<12	NS	<6	<2.9	NS	<2	<2.9

Notes:

Detected results are shown in bold. Values which exceed the screening level are shown shaded.

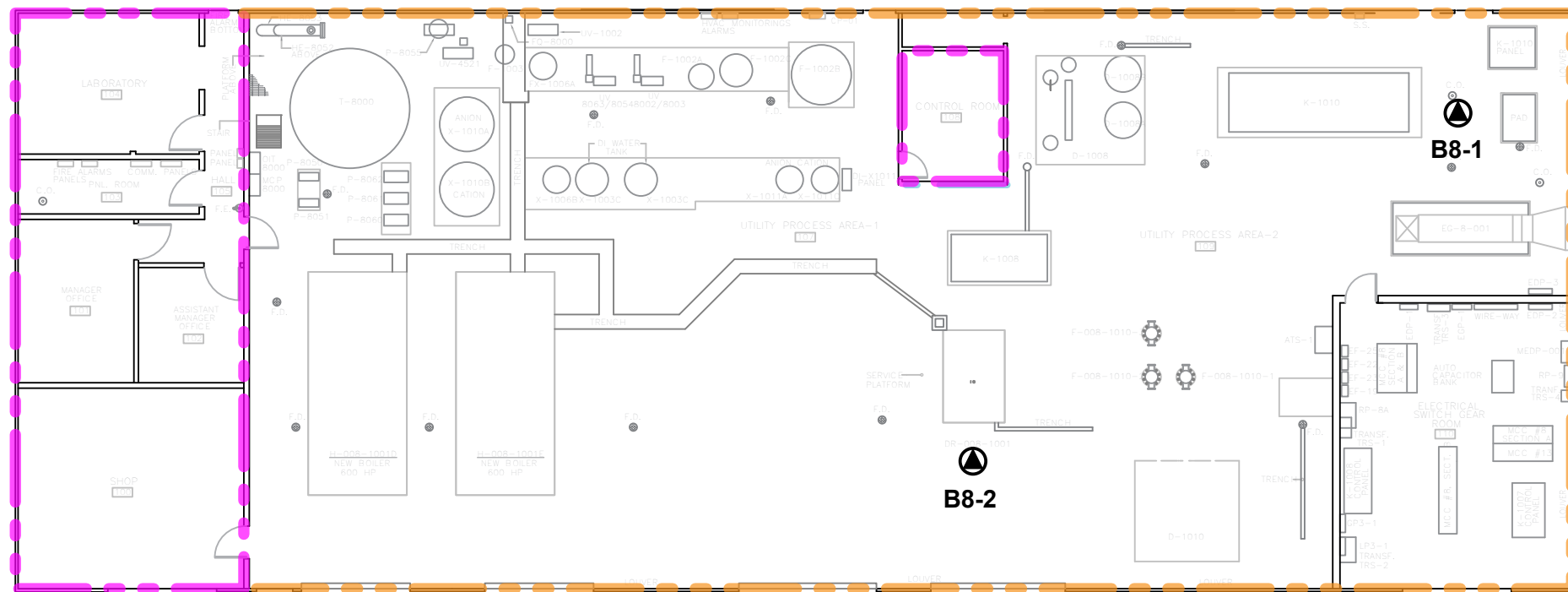
---: The USEPA has not developed a vapor intrusion screening level for this parameter.

NS: No Sample Results

J: Indicates an estimated value

Methanol and methane results from the October 2015 sampling were reported from samples collected on October 10th.

Figures



LEGEND



Co-Located Sub-Slab/
Indoor Air Sample Location



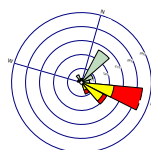
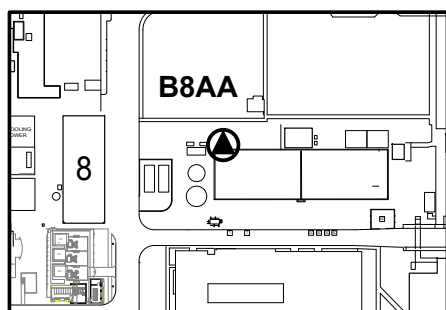
Area Served by Dedicated Air Conditioner



Area Ventilated by Exhaust Fans



GRAPHIC SCALE



Scale:
As Shown

Date:
Jul 2016

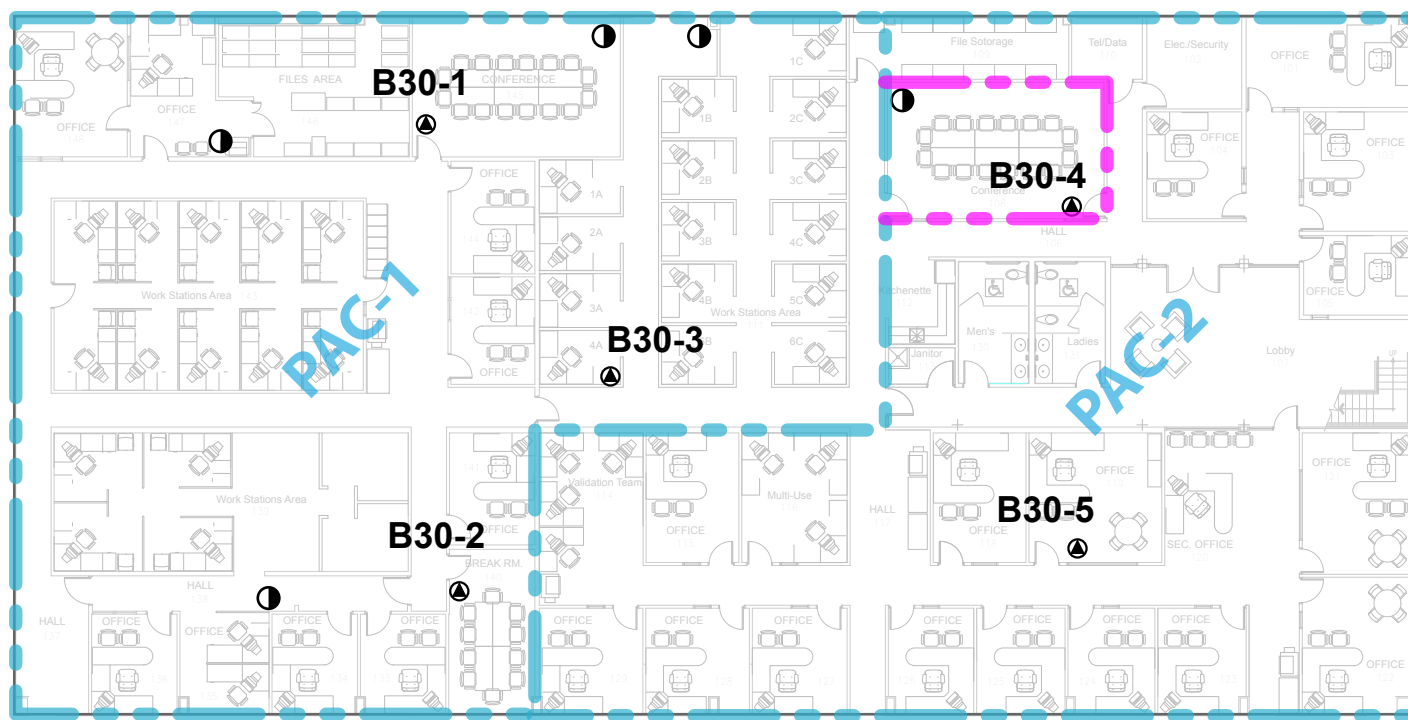
ANDERSON - MULHOLLAND
& ASSOCIATES, INC.

PURCHASE, NEW YORK

Figure 1

Building 8 Layout and Sample Locations

Bristol-Myers Squibb Manufacturing Company
Humacao, Puerto Rico



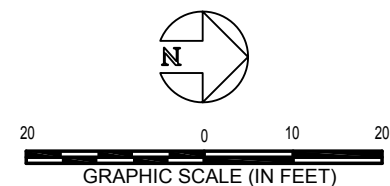
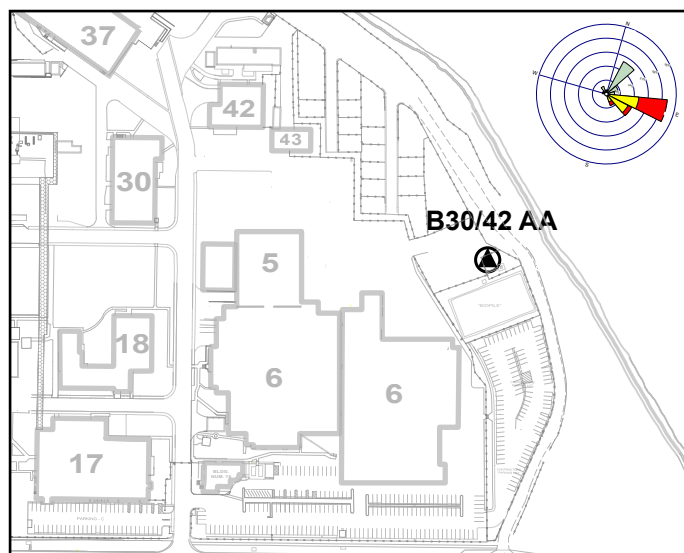
LEGEND

▲ Co-Located Sub-Slab/
Indoor Air Sample Location

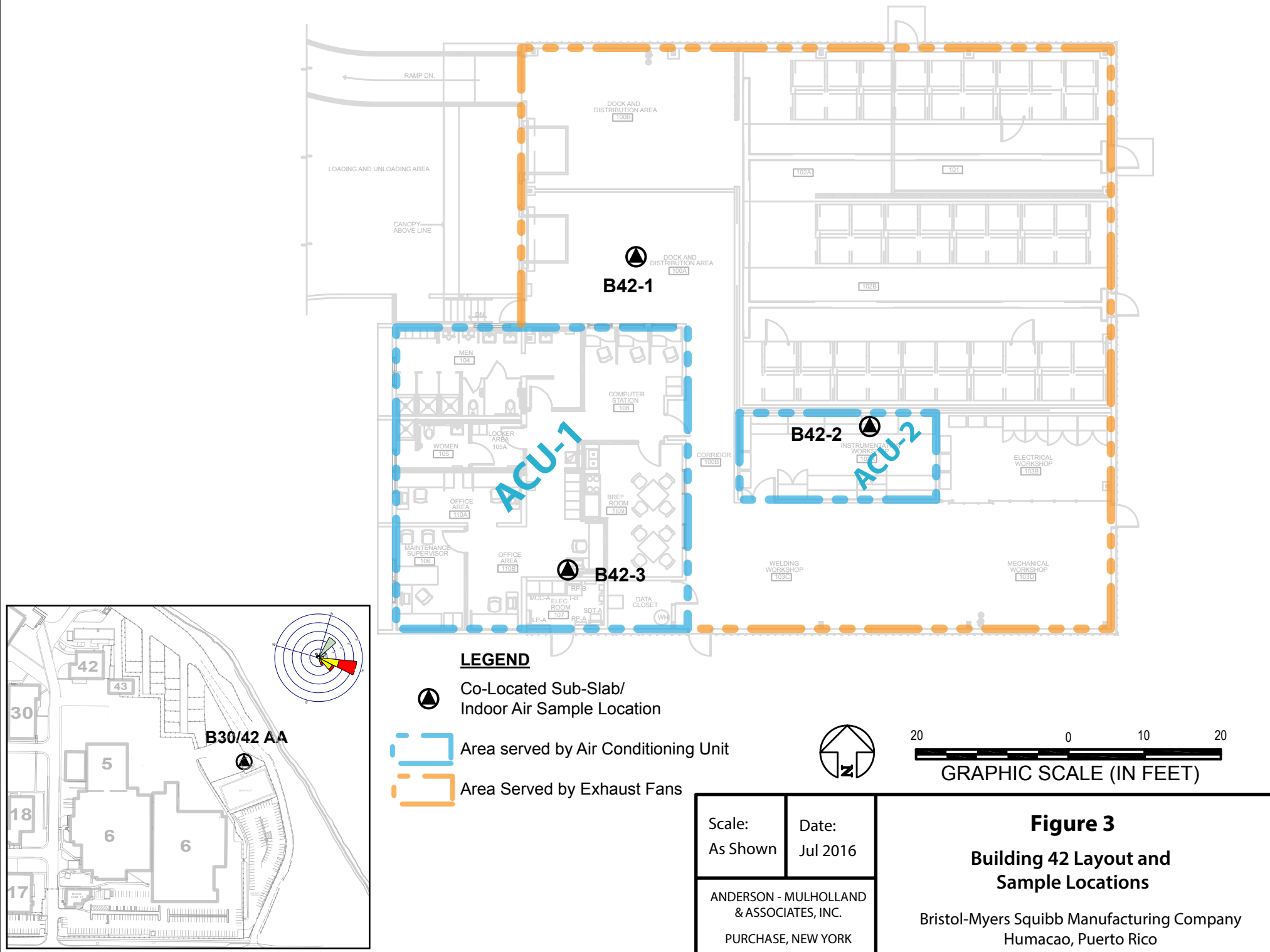
● Location of Aller Air Carbon Unit

— HVAC Zone/ HVAC ID

— Area Served by Portable Air Conditioner



Scale: As Shown	Date: Jul 2016	<div>Figure 2</div> <div>Building 30 Layout and Sample Locations</div> <div>Bristol-Myers Squibb Manufacturing Company Humacao, Puerto Rico</div>
ANDERSON - MULHOLLAND & ASSOCIATES, INC. PURCHASE, NEW YORK		



*Attachment 2:
January 2016 Vapor Intrusion Laboratory Analytical and
Data Validation Reports
(on CD)*

***Acceptance of the December 2016 Response to EPA
Comments on the RCRA Corrective Action Program
Quarterly Report No. 62, 1st Quarter 2016***

United States Environmental Protection Agency

March 8, 2017



- 8 MAR 2017

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CARIBBEAN ENVIRONMENTAL PROTECTION DIVISION
CITY VIEW PLAZA, SUITE 7000
#48 165 RD. KM 1.2
GUAYNABO, PR 00968-8069

CERTIFIED MAIL /RETURN RECEIPT REQUESTED

Article Number: 7015 0920 0000 8688 5146

Mr. Alvin E. Crespo, Director
Environmental Health and Safety
Bristol-Myers Squibb Manufacturing Company
Humacao Operations
P.O. Box 609
Humacao, Puerto Rico, 00792-1255

Re: Acceptance of the December 2016 Response to EPA Comments on the RCRA Corrective Action Program Quarterly Progress Report No. 62, 1st Quarter 2016
Bristol-Myers Squibb Manufacturing Company, Humacao, Puerto Rico
EPA ID Number: PRD 090021056

Dear Mr. Crespo:

The United States Environmental Protection Agency-Region 2 (EPA), in conjunction with the Puerto Rico Environmental Quality Board (EQB), has reviewed the letter dated December 16, 2016, in Response to the EPA Comments (Response) in the letter October 27, 2016 for the RCRA Corrective Action Program Quarterly Progress Report No. 62, 1st Quarter 2016 (Report), submitted by Bristol-Myers Squibb Manufacturing Company (BMSMC) for its facility in Humacao, Puerto Rico. Upon review of the Response, EPA has determined that it is complete and adequately addresses our previous comments and concerns. This Response shall be included as Attachment A of the RCRA Corrective Action Program Quarterly Progress Report No. 62, 1st Quarter 2016. If you have any questions regarding this correspondence, please contact Socorro Martinez of my staff at (787) 977-5886 or via email at martinez.socorro@epa.gov.

Sincerely,

Carmen R. Guerrero Pérez
Director
Caribbean Environmental Protection Division

Enclosure

cc: José Roque Julia, Acting Manager,
Land Pollution Control Program, PREQB

Attachment B
Groundwater Sampling Results



12/24/15

Technical Report for

Anderson, Mulholland & Associates

BMSMC, Building 5 Area, PR

SM04.00.06

Accutest Job Number: JC10289

Sampling Dates: 12/08/15 - 12/09/15

Report to:

Anderson, Mulholland & Associates

arice@amaiconsult.com

ATTN: Addison Rice

Total number of pages in report: 29



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink that reads 'Nancy F. Cole'.

Nancy Cole
Laboratory Director

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TN, TX, VA, WV, DoD ELAP (L-A-B L2248)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

Anderson, Mulholland & Associates

Job No: JC10289

BMSMC, Building 5 Area, PR

Project No: SM04.00.06

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JC10289-1	12/08/15	13:46 NMR	12/10/15	AQ	Ground Water	G-1R(3)
JC10289-2	12/08/15	15:47 NMR	12/10/15	AQ	Ground Water	UP-1
JC10289-3	12/09/15	10:30 NMR	12/10/15	AQ	Ground Water	S-31R(2)
JC10289-4	12/09/15	11:55 NMR	12/10/15	AQ	Ground Water	S-33
JC10289-4D	12/09/15	12:03 NMR	12/10/15	AQ	Water Dup/MSD	S-33 MSD
JC10289-4S	12/09/15	11:58 NMR	12/10/15	AQ	Water Matrix Spike	S-33 MS
JC10289-5	12/09/15	13:48 NMR	12/10/15	AQ	Ground Water	S-32
JC10289-6	12/09/15	10:35 NMR	12/10/15	AQ	Ground Water	S-31R(2)D
JC10289-7	12/09/15	16:27 NMR	12/10/15	AQ	Ground Water	A-1R(4)
JC10289-8	12/09/15	17:15 NMR	12/10/15	AQ	Ground Water	A-2R(2)
JC10289-9	12/09/15	17:15 NMR	12/10/15	AQ	Trip Blank Water	TB120915

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Anderson, Mulholland & Associates

Job No JC10289

Site: BSMC, Building 5 Area, PR

Report Date 12/23/2015 12:21:30 P

On 12/10/2015, 8 Sample(s), 1 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a maximum corrected temperature of 3.8 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JC10289 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260C

Matrix: AQ	Batch ID: V2D6342
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC10289-4MS, JC10289-4MSD were used as the QC samples indicated.

Matrix: AQ	Batch ID: V2D6345
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC10397-2MS, JC10397-1DUP were used as the QC samples indicated.
- JC10397-1DUP: (pH=7)Sample pH did not satisfy field preservation criteria.

Volatiles by GC By Method SW846-8015C (DAI)

Matrix: AQ	Batch ID: GGH5112
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC10289-4MS, JC10289-4MSD were used as the QC samples indicated.

Matrix: AQ	Batch ID: GGH5114
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC10289-6MS, JC10289-6MSD were used as the QC samples indicated.

Matrix: AQ	Batch ID: GGH5122
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover

Wednesday, December 23, 2015

Page 1 of 1

Summary of Hits

Job Number: JC10289
Account: Anderson, Mulholland & Associates
Project: BMSMC, Building 5 Area, PR
Collected: 12/08/15 thru 12/09/15

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC10289-1 G-1R(3)						
Ethylbenzene		25300	1000	270	ug/l	SW846 8260C
Toluene		109	100	16	ug/l	SW846 8260C
Xylene (total)		79400	1000	170	ug/l	SW846 8260C
JC10289-2 UP-1						
Ethylbenzene		8.3	1.0	0.27	ug/l	SW846 8260C
Xylene (total)		2.2	1.0	0.17	ug/l	SW846 8260C
JC10289-3 S-31R(2)						
Ethylbenzene		2470	20	5.4	ug/l	SW846 8260C
Xylene (total)		467	20	3.3	ug/l	SW846 8260C
JC10289-4 S-33						
Ethylbenzene		1.9	1.0	0.27	ug/l	SW846 8260C
Xylene (total)		6.2	1.0	0.17	ug/l	SW846 8260C
JC10289-5 S-32						
Ethylbenzene		39800	250	67	ug/l	SW846 8260C
Toluene		70.1 J	250	41	ug/l	SW846 8260C
Xylene (total)		66900	250	41	ug/l	SW846 8260C
JC10289-6 S-31R(2)D						
Ethylbenzene		2430	25	6.7	ug/l	SW846 8260C
Toluene		3.0 J	10	1.6	ug/l	SW846 8260C
Xylene (total)		484	10	1.7	ug/l	SW846 8260C
JC10289-7 A-1R(4)						
Benzene		3.1	2.5	1.2	ug/l	SW846 8260C
Ethylbenzene		351	5.0	1.3	ug/l	SW846 8260C
4-Methyl-2-pentanone(MIBK)		45.3	25	5.1	ug/l	SW846 8260C
Toluene		5.6	5.0	0.81	ug/l	SW846 8260C
Xylene (total)		1320	5.0	0.83	ug/l	SW846 8260C
JC10289-8 A-2R(2)						
Xylene (total)		0.49 J	1.0	0.17	ug/l	SW846 8260C

Summary of Hits

Job Number: JC10289
Account: Anderson, Mulholland & Associates
Project: BMSMC, Building 5 Area, PR
Collected: 12/08/15 thru 12/09/15



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

JC10289-9 TB120915

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 1

Client Sample ID:	G-1R(3)	Date Sampled:	12/08/15
Lab Sample ID:	JC10289-1	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150939.D	100	12/11/15	AM	n/a	n/a	V2D6342
Run #2	2D150932.D	1000	12/11/15	AM	n/a	n/a	V2D6342

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1000	330	ug/l	
71-43-2	Benzene	ND	50	24	ug/l	
100-41-4	Ethylbenzene	25300 ^a	1000	270	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	500	100	ug/l	
108-88-3	Toluene	109	100	16	ug/l	
1330-20-7	Xylene (total)	79400 ^a	1000	170	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	98%	76-120%
17060-07-0	1,2-Dichloroethane-D4	98%	97%	73-122%
2037-26-5	Toluene-D8	99%	99%	84-119%
460-00-4	4-Bromofluorobenzene	97%	99%	78-117%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	G-1R(3)	Date Sampled:	12/08/15
Lab Sample ID:	JC10289-1	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846-8015C (DAI)		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102723.D	1	12/14/15	XPL	n/a	n/a	GGH5112
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	99%		48-150%
111-27-3	Hexanol	107%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	UP-1	Date Sampled:	12/08/15
Lab Sample ID:	JC10289-2	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150933.D	1	12/11/15	AM	n/a	n/a	V2D6342
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	8.3	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	2.2	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		76-120%
17060-07-0	1,2-Dichloroethane-D4	98%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	98%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	UP-1						
Lab Sample ID:	JC10289-2					Date Sampled:	12/08/15
Matrix:	AQ - Ground Water					Date Received:	12/10/15
Method:	SW846-8015C (DAI)					Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR						

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102722.D	1	12/14/15	XPL	n/a	n/a	GGH5112
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	98%		48-150%
111-27-3	Hexanol	101%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-31R(2)	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-3	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150935.D	20	12/11/15	AM	n/a	n/a	V2D6342
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	200	66	ug/l	
71-43-2	Benzene	ND	10	4.7	ug/l	
100-41-4	Ethylbenzene	2470	20	5.4	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	100	20	ug/l	
108-88-3	Toluene	ND	20	3.2	ug/l	
1330-20-7	Xylene (total)	467	20	3.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	98%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	99%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-31R(2)	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-3	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846-8015C (DAI)		
Project:	BSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102721.D	1	12/14/15	XPL	n/a	n/a	GGH5112
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	87%		48-150%
111-27-3	Hexanol	99%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-33	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-4	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150926.D	1	12/11/15	AM	n/a	n/a	V2D6342
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	1.9	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	6.2	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	98%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	99%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-33						
Lab Sample ID:	JC10289-4					Date Sampled:	12/09/15
Matrix:	AQ - Ground Water					Date Received:	12/10/15
Method:	SW846-8015C (DAI)					Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102718.D	1	12/14/15	XPL	n/a	n/a	GGH5112
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	87%		48-150%
111-27-3	Hexanol	95%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-32		
Lab Sample ID:	JC10289-5	Date Sampled:	12/09/15
Matrix:	AQ - Ground Water	Date Received:	12/10/15
Method:	SW846 8260C	Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150936.D	250	12/11/15	AM	n/a	n/a	V2D6342
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	2500	830	ug/l	
71-43-2	Benzene	ND	130	59	ug/l	
100-41-4	Ethylbenzene	39800	250	67	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	1300	250	ug/l	
108-88-3	Toluene	70.1	250	41	ug/l	J
1330-20-7	Xylene (total)	66900	250	41	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	97%		73-122%
2037-26-5	Toluene-D8	99%		84-119%
460-00-4	4-Bromofluorobenzene	97%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-32						
Lab Sample ID:	JC10289-5					Date Sampled:	12/09/15
Matrix:	AQ - Ground Water					Date Received:	12/10/15
Method:	SW846-8015C (DAI)					Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102724.D	1	12/14/15	XPL	n/a	n/a	GGH5112
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	90%		48-150%
111-27-3	Hexanol	100%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-31R(2)D	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-6	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150992.D	10	12/14/15	AM	n/a	n/a	V2D6345
Run #2	2D150937.D	25	12/11/15	AM	n/a	n/a	V2D6342

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	100	33	ug/l	
71-43-2	Benzene	ND	5.0	2.4	ug/l	
100-41-4	Ethylbenzene	2430 ^a	25	6.7	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	50	10	ug/l	
108-88-3	Toluene	3.0	10	1.6	ug/l	J
1330-20-7	Xylene (total)	484	10	1.7	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	99%	76-120%
17060-07-0	1,2-Dichloroethane-D4	102%	98%	73-122%
2037-26-5	Toluene-D8	99%	99%	84-119%
460-00-4	4-Bromofluorobenzene	99%	98%	78-117%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	S-31R(2)D	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-6	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846-8015C (DAI)		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102744.D	1	12/15/15	XPL	n/a	n/a	GGH5114
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	96%		48-150%
111-27-3	Hexanol	96%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	A-1R(4)	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-7	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150938.D	5	12/11/15	AM	n/a	n/a	V2D6342
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	50	17	ug/l	
71-43-2	Benzene	3.1	2.5	1.2	ug/l	
100-41-4	Ethylbenzene	351	5.0	1.3	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	45.3	25	5.1	ug/l	
108-88-3	Toluene	5.6	5.0	0.81	ug/l	
1330-20-7	Xylene (total)	1320	5.0	0.83	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	99%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	97%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	A-1R(4)	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-7	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846-8015C (DAI)		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102747.D	1	12/15/15	XPL	n/a	n/a	GGH5114
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	96%		48-150%
111-27-3	Hexanol	106%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	A-2R(2)	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-8	Date Received:	12/10/15
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150934.D	1	12/11/15	AM	n/a	n/a	V2D6342
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	0.49	1.0	0.17	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		76-120%
17060-07-0	1,2-Dichloroethane-D4	98%		73-122%
2037-26-5	Toluene-D8	99%		84-119%
460-00-4	4-Bromofluorobenzene	101%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	A-2R(2)						
Lab Sample ID:	JC10289-8					Date Sampled:	12/09/15
Matrix:	AQ - Ground Water					Date Received:	12/10/15
Method:	SW846-8015C (DAI)					Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102748.D	1	12/15/15	XPL	n/a	n/a	GGH5114
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	95%		48-150%
111-27-3	Hexanol	102%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	TB120915	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-9	Date Received:	12/10/15
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D150991.D	1	12/14/15	AM	n/a	n/a	V2D6345
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		76-120%
17060-07-0	1,2-Dichloroethane-D4	101%		73-122%
2037-26-5	Toluene-D8	98%		84-119%
460-00-4	4-Bromofluorobenzene	100%		78-117%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	TB120915	Date Sampled:	12/09/15
Lab Sample ID:	JC10289-9	Date Received:	12/10/15
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846-8015C (DAI)		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH102860.D	1	12/22/15	XPL	n/a	n/a	GGH5122
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	80%		48-150%
111-27-3	Hexanol	84%		48-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

Accutest Job #: JC10289
Accutest Quote #:

Client Information				Facility Information				Analytical Information															
Anderson Mulholland & Associates				Anderson Mulholland and Associates Inc.																			
Name 2700 Westchester Avenue				Project Name																			
Address Purchase NY 10577				Location																			
City State Zip Terry Taylor				Project/PO #: BMS: Building 5 Area																			
Send Report to: Phone #: 914-251-0400				FAX #: 914-251-1286																			
Field ID / Point of Collection		Date	Time	Sampled By	Matrix	# of bottles	HCL	NaOH	HNO3	H2SO4	None	VOCs (Special List 3)											
G-1 R(3)		12/8/15	1346	NMR	GW	6	X					X	1										
UP-1		12/8/15	1547	NMR	GW	6	X					X	2										
S-31 R(2) *		12/9/15	1030	NMR	GW	6	X					X	3										
S-33			1155	NMR	GW	6	X					X	4										
S-32			1348	NMR	GW	6	X					X	5										
S-31 R(2) D			1035	NMR	GW	6	X					X	6										
S-33 MS			1158	NMR	GW	6	X					X	4										
S-33 MSD			1203	NMR	GW	6	X					X	7	INITIAL ASSESSMENT <u>4A BU</u>									
A-1 R(4)			1627	NMR	GW	6	X					X	8	LABEL VERIFICATION <u>JK</u>									
A-2 R(2) *			1745	NMR	GW	6	X					X	9										
T13120915		12/9/15	1745	NMR	W	2	X																
Turnaround Information				Data Deliverable Information				Comments / Remarks															
<input checked="" type="checkbox"/> 21 Day Standard <input type="checkbox"/> 14 Day <input type="checkbox"/> 7 Days EMERGENCY <input type="checkbox"/> Other _____ (Days) RUSH TAT is for FAX data unless previously approved.				Approved By: _____ <input type="checkbox"/> NJ Reduced <input checked="" type="checkbox"/> NJ Full <input type="checkbox"/> FULL CLP <input type="checkbox"/> Disk Deliverable <input type="checkbox"/> Other (Specify) _____				<input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input type="checkbox"/> ASP Category B <input type="checkbox"/> State Forms				Federal Express ID # <u>801219535401</u> Lab Trip Blank Date <u>12/3/15</u> Time <u>1000</u> VOC's samples collected in 40 ml. glass vials, provided by the lab. Analyze for Special List 3 compounds (acetone, benzene, ethylbenzene, toluene, MIBK, xylene, IPA and methanol). <u>*QC vials</u>											
Sample Custody must be documented below each time samples change possession, including courier delivery.																							
Relinquished by Sampler:		Date Time:		Received By:		Relinquished By:		Date Time:		Received By:													
1 <u>[Signature]</u>		12/9/15/1758		1 <u>FOOTE</u>		2 <u>FOOTE</u>		12/10/15 0910		2 <u>[Signature]</u>													
Relinquished by Sampler:		Date Time:		Received By:		Relinquished By:		Date Time:		Received By:													
3				3		4				4													
Relinquished by Sampler:		Date Time:		Received By:		Seal #		Preserved where applical		On Ice:													
5				5		774		<u>ye</u>		<u>ye</u>		3.4°C											

JC10289: Chain of Custody

Page 1 of 3

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JC10289 **Client:** ANDERSON MULHOLLAND **Project:** BMS: Building 5 Area
Date / Time Received: 12/10/2015 9:10:00 AM **Delivery Method:** FedEx **Airbill #s:** 801219535401

Cooler Temps (Raw Measured) °C: Cooler 1: (3.4);
 Cooler Temps (Corrected) °C: Cooler 1: (3.8);

Cooler Security Y or N Y or N
 1. Custody Seals Present: ☒ ☐ 3. COC Present: ☒ ☐
 2. Custody Seals Intact: ☒ ☐ 4. Smpl Dates/Time OK ☐ ☒

Cooler Temperature Y or N
 1. Temp criteria achieved: ☒ ☐
 2. Cooler temp verification: IR Gun
 3. Cooler media: Ice (Bag)
 4. No. Coolers: 1

Quality Control Preservation Y N N/A
 1. Trip Blank present / cooler: ☒ ☐ ☐
 2. Trip Blank listed on COC: ☒ ☐ ☐
 3. Samples preserved properly: ☒ ☐
 4. VOCs headspace free: ☒ ☐ ☐

Sample Integrity - Documentation Y or N
 1. Sample labels present on bottles: ☒ ☐
 2. Container labeling complete: ☒ ☐
 3. Sample container label / COC agree: ☒ ☐

Sample Integrity - Condition Y or N
 1. Sample recvd within HT: ☒ ☐
 2. All containers accounted for: ☒ ☐
 3. Condition of sample: Intact

Sample Integrity - Instructions Y N N/A
 1. Analysis requested is clear: ☒ ☐
 2. Bottles received for unspecified tests: ☐ ☒
 3. Sufficient volume recvd for analysis: ☒ ☐
 4. Compositing instructions clear: ☐ ☐ ☒
 5. Filtering instructions clear: ☐ ☐ ☒

Comments -8 Collection time on labels is 17:15, not 17:45. ID and date ok
 -9 No analysis marked off for TB



Sample Receipt Summary - Problem Resolution

Accutest Job Number: JC10289

Initiator: ANDREWS

CSR: Tammym

Response Date 12/10/2015

Response: Use 17:15 as the sample time for JC10289-8
Sample JC10289-9 should be analyzed for Special List 3.
Per Terry Taylor

5.1

5

JC10289: Chain of Custody
Page 3 of 3

Attachments (on CD)

Attachment C

*Vapor Intrusion Sampling Results
(see Attachment A for Updated VI Results)*

Attachment D

*Laboratory Analytical Reports, Data Validation
Reports, and Groundwater Field Data Sheets*